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# USSR Report

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BIOMEDICAL AND BEHAVIORAL SCIENCES



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BIOMEDICAL AND BEHAVIORAL SCIENCES

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BRIEFS

MICROBIOLOGY INSTITUTE--Associates at the All-Union Scientific Research Institute of Agricultural Microbiology have linked resolution of the problems of developing agricultural production within the framework of the "Intensification-90" territorial-branch program approved by the CPSU Central Committee with the extensive use of microorganisms. Creating highly effective compounds based on them is a main line of their research. The institute collective is concerned with problems connected with increasing crop yields, improving feed production, utilizing stockraising-complex wastes and developing microbiological means of plant protection. Just in recent years, laboratories have created a whole series of effective compounds whose use will facilitate implementation of the USSR Food Program. Among them, one should first of all single out rhizotropin, designed to raise bean crop yields. It is composed of rhizobia capable of drawing nitrogen from the air. Lupine, alfalfa and vetch seed treated with it in the pre-sowing period are nearly four times more productive, and nitrogen fertilizer expenditures are reduced three-fold. The institute is developing microbiological means of plant protection designed to combat various pests such as insects. One outstanding feature of such compounds is their very selective action. Deadly to practically all pests, they remain completely harmless to useful insects and do not contaminate the environment. Initial results enable us to speak of the promise of these new methods, and the annual economic impact of utilizing the developments of institute associates is already 10 million rubles. In the photo [not reproduced]: Junior associate L. S. Zinovyev uses a micro-computer to process experiment results. [Text] [Leningrad LENINGRADSKSYA PRAVDA in Russian 26 Apr 85 p 2] 11052

CSO: 1840/321

CORRECTION OF LIPID METABOLISM IN RATS WITH LIMITED MOBILITY BY INFRALOW  
FREQUENCY MAGNETIC FIELD

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 24 May 82; after revision 7 Jul 82) pp 313-316

TEMURYANTS, N. A., YEVSIFYEVA, Ye. V. and MAKEYEV, V. B., Simferopol State  
University imeni M. V. Frunze

[Abstract] A study was made of the influence of infralow frequency variable magnetic field on lipid metabolism in rats with limited mobility. 420 White rats were studied, some of which were maintained under ordinary conditions, some under ordinary conditions but exposed to the magnetic field three hours a day, some in individual glass cages measuring  $14 \times 6 \times 5.5$  cm, some in the glass cages with exposure to the magnetic field. The magnetic field had a frequency of 8 Hz, intensity 4.1 A/m. Cholesterol levels in the liver tissue after 45 days were as follows: control group  $1.00 \pm 0.07$ , group two  $0.8 \pm 0.1$ , hypokinesia group  $2.6 \pm 0.3$ , hypokinesia + magnetic field  $0.9 \pm 0.1$ . The results indicated that the variable magnetic field tended to normalize the metabolic function of the liver in rats with enforced hypokinesia.

Figure 1; references 10 (Russian).

[1857-6508]

UDC 577.214.3

IDENTIFICATION OF HISTIDINE RESIDUE IN ACTIVE CENTER OF ESCHERICHIA COLI  
RNA-POLYMERASE

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 3, Mar 85  
(manuscript received 3 Sep 84) pp 723-726

GRACHEV, M. A., MUSTAYEV, A. A. and KOLOCHEVA, T. I., Institute of Bio-  
organic Chemistry, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] Affinity labeling with beta-imidazole GDP, DNA phage T7 promotor, and alpha-<sup>32</sup>P-UTP were used to mark the histidine residue in the active site of E. coli RNA-polymerase. Mild acid treatment led to complete demodification, while kinetic demodification with dodecylsulfate corresponded to that obtained with model modified histidine, and differed sharply from kinetic hydrolysis of a phosphamide bond. The histidine residue was identified by degrading the labeled peptide with cyanogen bromide and measuring the length of the radioactive peptides obtained by SDS disc-electrophoresis. This indicated that the labeled histidine was between methionines 1107 and 1119. The only histidine in this location is number 1116. This method for partial protein sequencing has general applicability. Figures 3; references 10:

4 Russian, 6 Western.

[1846-12126]

UDC 577.1:547.963.3

AFFINITY LABELING OF (2', 5')-OLIGOADENYLATE-ACTIVATED ENDONUCLEASE BY

[<sup>32</sup>P]-2',5'-A AND ITS ANALOGS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 5, Apr 85  
(manuscript received 28 May 84) pp 1255-1258

SAARMA, M. Yu., MINKS, M. A. and GORDON, DZh., Institute of Chemical and  
Biological Physics, Estonian SSR Academy of Sciences, Tartu

[Abstract] Since 2', 5'-A(2', 5'-apolymerase) has been shown to be induced by interferon and is responsible for the activation of an endoribonuclease, which then degrades viral RNA and mRNA, and via this mechanism mediates interferon-induced suppression of viral replication, an attempt was made to further define the specific (2', 5')oligoadenylate activated endonuclease. Basically, two approaches were taken. One consisted of periodate oxidation of 2', 5'-A,



and the other relied on [ $^{32}\text{P}$ ] labeled 2', 5'-A. The affinity labels resulted in the identification of an 80,000 MW protein as the endoribonuclease of interest in HeLa and rabbit reticulocyte cells from affinity chromatography columns. The role of two other proteins (40,000 and 20,000 MW) that also sustained labeling remains unclear at present. They may, however, be involved in the dephosphorylation of 2',5'-A. Figures 2; references 11 (Western), [1884-12172]

## BIONICS

### VIBRATION ACTIVITY OF MUSCLES

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 27 Jun 83; after revision 9 Apr 84) pp 328-331

KUZNETSOV, V. V., All-Union Scientific Research Institute of Physical  
Culture, Moscow

[Abstract] Experimental studies of the natural vibrations of the biomechanical elements of the human body were performed by exciting oscillations with quasistatic muscular tension. The variation in oscillating frequency is studied as a function of moment of inertia of the biomechanical system oscillating around its instantaneous axis of rotation perpendicular to the plane passing through the longitudinal axis of the element and the direction of action of the static force with fixed moment of force. The moment of inertia was changed by increasing the mass of the system. The induced oscillations of all elements of the biomechanical systems studied are described by the equations for oscillation of a mechanical oscillator. When muscular tension is maintained constant and moment of inertia changed in a biomechanical system the energy of the mechanical oscillations was found to remain constant; when muscular tension was changed the ratio of mean kinetic energy of the biomechanical oscillator to oscillating frequency remained invariant. The contractions of the muscles can be described by the apparatus of statistical physics. Figures 4; references 7: 2 Russian, 5 Western.  
[1857-6508]

FLUORESCENCE OF BOVINE RETINAL ROD RHODOPSIN AT  $-196^{\circ}\text{C}$

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 5, Apr 85  
(manuscript received 9 Oct 84) pp 1471-1474

SINESHCHEKOV, V. A. and LITVIN, F. F., Moscow State University imeni  
M. V. Lomonosov

[Abstract] An analysis was conducted on the fluorescence pattern of photochemically active rhodopsin in bovine retinal rods at  $-196^{\circ}\text{C}$ , for comparison with data obtained from other lifeforms. Excitation at 436 nm resulted in fluorescence maximum at 640-650 nm with two well-defined shoulders at 605 and 690 nm. The quantum yield of fluorescence at  $-196^{\circ}\text{C}$  was below  $10^{-3}$ , corresponding to an excited-state lifetime of less than  $10^{-11}$  sec. The similarities observed here with the previously reported data for frog rhodopsin and bacteriorhodopsin indicate considerable similarities in the photochemistry of these pigments. It appears that the primary photophysical processes previously reported for bacteriorhodopsin [Sineshchekov, V. A., et al., Biofizika, 26(6):964, 1981], are applicable to the primary visual act which involves rhodopsin. Figures 4; references 12: 4 Russian, 8 Western.  
[1886-12172]

UDC 547.56:577.352.465

PROTONOPHORIC AND CHANNEL-FORMING PROPERTIES OF GOSSYPOL AS FUNCTION OF pH

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 5, Apr 85  
(manuscript received 17 Sep 84) pp 1245-1247

KRASIL'NIKOV, O. V., ZARIPOVA, R. K., KALAYDZHYAN, V. A. and  
TASHMUKHAMEDOV, B. A., Institute of Biochemistry, Uzbek SSR Academy of  
Sciences, Tashkent

[Abstract] The effects of variation in pH were studied on the protonophoric and channel-forming properties of gossypol, to further define its membrane effects which may possibly be related to the immunosuppressive effects of gossypol. Studies in the pH range 3.5-7.0 with bilayer lipid membranes formed from oxidized cholesterol showed that at low pH values and low gossypol concentrations ( $1.5 \times 10^{-5}$  M) the effects were protonophoric. As the pH was

increased into the alkaline region proton transport was diminished and potassium transport became important in direct proportion to the increase in pH. Promotion of  $K^+$  transport was correlated with a more aggregated state of gossypol. Gossypol was, therefore, demonstrated to be a membrane-active agent that can facilitate the transport of either  $H^+$  or  $K^+$  across membranes, depending on the degree of its aggregation in the membrane. Figures 3; references 9: 6 Russian, 3 Western.  
[1884-12172]

UDC 577.352:465

ION TRANSPORT MECHANISMS IN CHANNELS FORMED BY STEATODA PAYKULLIANA SPIDER VENOM IN BILAYER PHOSPHOLIPID MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 3, Mar 85  
(manuscript received 8 Jun 84) pp 256-265

MIRONOV, S. L., SOKOLOV, Yu. V. and LISHKO, V. K., Institute of Physiology imeni A. A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev; Institute of Biochemistry imeni A. V. Palladin, Ukrainian Academy of Sciences, Kiev

[Abstract] A detailed study is presented of the selectivity of the ionic channel formed by Steatoda paykulliana spider venom in a bilayer phospholipid membrane with respect to various bivalent and monovalent cations. The basic characteristics of a model channel formed by the venom and calcium channels in biological membranes are compared. A mathematical model of synaptic transmission involving  $Ca^{2+}$  as an inductor of neuromediator output into the synaptic slit is used to analyze a possible mechanism of the toxic action of the poison. The current carried by the ions through the channel is found to depend little on the potential barrier, being primarily determined by the depth of the potential hole for the ion in the channel, which is determined by its affinity to the cation-bonding center of the channel. Channels can transmit alkali metal cations which are not bonded by the channel. It is suggested that there are two conducting states of the channel which may alternate upon bonding of a single bivalent calcium ion. Figures 6; references 16: 4 Russian, 12 Western.  
[1856-6508]

# INFLUENCE OF MEMBRANES ON TRANSDUCIN-DEPENDENT ACTIVATION OF CYCLIC NUCLEOTIDE PHOSPHODIESTERASE FROM BOVINE RETINAL ROD OUTER SEGMENTS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 3, Mar 85  
(manuscript received 17 Oct 84) pp 272-276

DIZHUR, A. M., ARSHAVSKIY, V. Yu., RYBIN, V. O. and FILIPPOV, P. P.,  
Moscow State University imeni M. V. Lomonosov, Interfaculty Problem Scientific  
Research Laboratory of Molecular Biology and Bioorganic Chemistry imeni  
A. N. Belozerskiy; All-Union Cardiologic Scientific Center, USSR Academy of  
Medical Sciences, Moscow

[Abstract] Photosensitization of rhodopsin in the outer segments of rods leads to activation of the GTP-bonding protein transducin, consisting of the exchange of GDP bonded with transducin for GTP. This article studies the influence of membranes on the activation of phosphodiesterase by transducin containing bonded GNP, a nonhydrolyzable analog of GTP. Dark adaptation of photoreceptor membranes in outer rod segments containing no photo-excited rhodopsin increases the stimulating effect of the complex of transducin plus GNP on the activity of phosphodiesterase by several times. The effect cannot be explained by additional activation of the transducin itself. The increase in transducin-dependent activation of PDE does not result from photo-excited rhodopsin. Data are not presently sufficient to indicate the mechanism of the effect described of dark membranes on transducin-dependent PDE activation. The results of this work indicate that the role of the membrane matrix in light-dependent activation of PDE in retinal rods is important. Figures 3; references 15: 2 Russian, 13 Western.  
[1856-6508]

## FORMATION OF LIPID FREE RADICALS PHOTSENSITIZED BY PSORALENES AT 77 K

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 19 Jun 84) pp 239-243

GAVRILOV, V. B., POTAPENKO, A. Ya., BAGAYEV, A. V., AZIZOVA, O. A. and  
VLADIMIROV, Yu. A., Second Moscow State Medical Institute imeni N. I. Pirogov

[Abstract] The reaction of formation of DNA-dye photoadducts is widely used in phototherapy of skin diseases to inhibit pathologic proliferation of skin cells. The biologic effect is largely determined by the activating effect of psoralenes on the photooxidation of lipids. To study the free radical mechanism of photochemical interaction of psoralenes with lipids, EPR was used to investigate photosensitizing reactions occurring upon low-temperature UV irradiation of model lipid systems (saturated and unsaturated fatty acids) in the presence of 8-methoxypsoralene (8-MOP). It is found that 8-MOP has no influence on photogeneration of free radicals of saturated fatty acids but leads to photosensitized formation of dienyl and alkyl radicals of polyunsaturated fatty acids. The appearance of free radicals is thus related to



the interaction of 8-MOP with unsaturated fatty acid structures alone and does not include reactions involving the carboxyl group of these compounds. Two mechanisms of photosensitized reactions are suggested as possible mechanisms of the reactions occurring upon low temperature UV irradiation of 8-MOP and polyunsaturated fatty acids: a mechanism including electron phototransfer and a mechanism including energy migration. Further studies may indicate which of these two mechanisms is more probable. Figures 2; references 21: 8 Russian, 13 Western.  
[1857-6508]

#### ROLE OF MICROFILAMENTS IN REGULATION OF FUNCTIONAL ACTIVITY OF HIGHLY PERMEABLE MEMBRANE CONTACTS

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 3 Jul 84) pp 273-277

MAZHUL, V. M., KONEV, S. V., YANCHEVSKAYA, T. G. and MAZHUL, I. V.,  
Institute of Photobiology, Belorussian SSR Academy of Sciences, Minsk

[Abstract] A study is reported of the influence of cytochalasin B (CB), an agent breaking down the submembrane network of microfilaments, on intercellular transfer of small inorganic ions and fluorescein molecules in the saliva gland of the drosophila larva. The breakdown of intercellular communications discovered under the influence of CB is considered to confirm the conclusion that the regulation of intercellular communications involves the microfilaments. Studies were performed on the saliva glands of *Drosophila virilis* in the third larval stage. The level of intercellular diffusion exchange of small inorganic ions was estimated on the basis of the electrical coupling coefficient measured in an experiment with two glands connected by a duct and held in a glass chamber filled with Ringers solution. The permeability of the slot contact channels for organic molecules was judged from the capability of fluorescein for intercellular diffusion, estimated by fluorescent measurements of the kinetics of loss of the dye from cells into which it was preliminarily introduced by ionophoresis. Figures 3; references 18: 5 Russian, 13 Western.  
[1857-6508]

#### CHANGE IN PERMEABILITY OF NERVE FIBER MEMBRANES UNDER CONDITIONS OF INITIATION OF PEROXIDATION OF LIPIDS

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 18 Jan 84) pp 278-280

REVIN, V. V., MAKSIMOV, G. V., MUSURALIYEVA, G. T. and KOL'S, O. R.,  
Biology Faculty, Moscow State University imeni M. V. Lomonosov;  
Mordovian State University

[Abstract] An attempt was made to reveal changes in the absorption of sodium and calcium ions by nerve fibers with an increase in peroxidation of lipids

and to trace these changes at rest and during propagation of rhythmic excitation, i.e., under conditions of normal nerve functioning. Experiments were performed on isolated nerves from the extremities of Black Sea crabs. Some of the nerves had been held in Ringers solution, others in Ringers solution containing iron ascorbate. In both series, the content of lipid peroxidation products and absorption of sodium and calcium ions from the surrounding medium were determined at rest and upon rhythmic excitation. It was found that at rest, with lipid peroxidation increased by 30%, there is a greater increase in absorption of sodium ions and calcium ions. With initiation of lipid peroxidation, stimulus leads to an increase in the content of diene conjugates by 118%, the concentration of lipid peroxidation products being 21 n M/mg of lipid, while absorption of Na and Cl increase greatly. Increasing lipid peroxidation causes the stimulation effect to be greatest on the permeability for sodium ions. The results indicate that intensification of calcium transport, upon increased lipid peroxidation, results from an increase in conductivity due to the formation of channels in the lipid phase of the membranes. Sodium transport, which increases greatly upon excitation, is related not only to changes in the lipid phase, but also to the influence of lipid peroxidation products on the conductivity of potential-dependent sodium channels. Figure 1; references 11: 8 Russian, 3 Western, [1857-6508]

#### DEVELOPMENT OF AUTO-WAVES DURING AGGREGATION OF DICTYOSTELIUM DISCOIDEUM

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 4 Oct 83) pp 341-346

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[Abstract] A study is made of possible dynamic conditions of behavior of dictyostelium discoideum cells in clusters in the early stage of aggregation. Attention is concentrated on this phase of aggregation rather than behavior of the aggregates themselves. The analysis explains how the necessary circular wave of excitation is stimulated. It may be formed in an initially homogeneous system as a result of rigid excitation from the state of synchronous autooscillations. The distribution of cell densities is described based on the profile of cAMP concentration in the wave. The stable homogeneous autooscillations or circular cAMP wave traveling around the boundary of a cluster evoke concentric or spiral aggregation waves in the surrounding cells. Figures 5; references 10: 3 Russian, 7 Western. [1857-6508]

# ABSENCE OF INFLUENCE OF MAGNETIC FIELD ON INTENSITY OF BACTERIAL LUMINESCENCE

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 20 Feb 84) pp 349-351

PETUSHKOV, V. N., Institute of Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk

[Abstract] A magnetic field is found to have no effect on the intensity of bacterial luminescence in vitro. This indicates that recombination of radicals does not participate in the formation of the electron-excited state of the bacterial luminescence emitter. The studies were performed on enzyme preparations isolated from luminescent bacteria from the collections of the authors institute. It is suggested that a purely ionic mechanism of chemical excitation is involved in bacterial luminescence. References 3 (Russian). [1857-6508]

# FORMATION OF HOLOTURIN A TRITERPENE GLYCOSIDE COMPLEX WITH CHOLESTEROL IN LIPOSOMAL MEMBRANES

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 27 Dec 83; after revision 7 May 84) pp 358-359

LIKHATSKAYA, G. N., YAROVAYA, T. P., RUDNEV, V. S., POPOV, A. M., ANISIMOV, M. M. and ROVIN, Yu. G., (deceased), Institute of Chemistry, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok; Pacific Ocean Institute of Bioorganic Chemistry, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok

[Abstract] Triterpene Glycoside--holoturin A--has a broad spectrum of medical and biological activity, selectively suppressing the reproduction of fungal and yeast microflora, inducing disruption of selective permeability of cell membranes, forming ion channels and changing the stability of model membranes. Data are presented in this article on the interaction of holoturin A with lipid-cholesterol liposomes as determined by differential scanning microcalorimetry. When holoturin A is added to liposomes containing cholesterol there is a partial restoration of the peak of the major transition, the maximum effect being noted at a molar glycoside/cholesterol ratio of 1/2. With higher concentrations of glycoside the intensity of the peak decreases, apparently a result of the perturbing influence on the phase transition by the glycoside which does not enter into a complex with the cholesterol. Figure 1; references 8: 5 Russian, 3 Western. [1857-6508]

UDC 657.62+576.8

MODIFIED NUTRIENT MEDIA FOR ARSENIC-UTILIZING MICROORGANISMS

Dushanbe DOKLADY AKADEMII NAUK TADZHISKIY SSR in Russian Vol 27, No 12,  
Dec 84 (manuscript received 11 Nov 84) pp 721-724

SOLOZHENKIN, P. M., academician, Tajik SSR Academy of Sciences,  
LYUBAVINA, L. L., KOPITSYA, T. P. and GAL'CHENKO, A. I., Institute  
of Chemistry imeni V. I. Nikitin, Tajik SSR Academy of Sciences

[Abstract] *Scopulariopsis brevicaule* 406 has been demonstrated to be effective in biological decontamination of arsenic-containing industrial waste waters. In order to increase the available biomass of this fungus several sources of carbon have been investigated, to supplement the standard medium (Czapek's) on which this fungus is routinely cultivated. Two media have been developed based on industrial sources of waste carbon that are effective in increasing the biomass 2- and 3-fold. The first was based on wastes emanating from coal processing, and the second from byproducts of cotton seed production. On both media, arsenic uptake approached 100%. The cost effectiveness of the new media was 9.5-fold in comparison with Czapek's medium per one kilogram of biomass. References 10 (Russian).  
[1890-12172]

UDC 579.841.91--24

STUDY OF GROWTH OF HYDROGEN OXIDIZING BACTERIA AND CARBOXYDOBACTERIA DURING COMBINED CULTIVATION OF THEM

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 25 Apr 83) pp 709-713

VOLOVA, T. G., STASISHINA, G. N. and KASAYEVA, G. Ye., Institute of  
Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk

[Abstract] Study of combined cultivation of hydrogen-oxidizing bacteria and carboxydobacteria in an intensive culture on a CO-hydrogen-containing substrate was described and discussed. The region of coexistence of hydrogen-oxidizing bacterium *A. eutrophus* Z-1 and carboxydobacterium *S. carboxydohydrogena* Z-1062 was found experimentally in a continuous dense cultivation region with use of a gas substrate containing hydrogen, oxygen, carbon dioxide and carbon monoxide. One of the organisms displaces the other when the hydrogen-carbon monoxide ratio changes in the gaseous phase. Hydrogen is the energy



source for both strains studied and carbon dioxide is the carbon source while carbon monoxide is an additional source of energy for the carboxydobacteria. Figure 5; references 13: 12 Russian, 1 Western.  
[1803-2791]

#### SCHOOL SEMINAR DEVOTED TO MEDICAL AND BIOLOGICAL CYBERNETICS

Moscow IZVESTIYA in Russian 11 Apr 85 p 6

MANUCHAROVA, Ye. and NEBEL'SKIY, V.

[Abstract] This article entitled "The 'Third Degree' discusses proceedings of the 14th All-Union School Seminar "BIMK-85" dealing with problems of biological and medical cybernetics, attended by representatives of many scientific disciplines, from 75 scientific centers. The friendly, cooperative interdisciplinary nature of carrying out the work of the conference is emphasized, a brief account of the 14 years of existence of the school is presented and the importance of the multidisciplinary, well-trained, erudite faculty to the success of the school is pointed out. A microminiature system which assesses the state and behavior of biological objects in bioengineering systems in a real time scale, developed by graduate student Alexey Kvitkov, won a diploma of the 1st degree awarded by the Council on Cybernetics, USSR Academy of Sciences, at BIMK-85. One of the many reports presented at the seminar is described and discussed. It is a study of the behavior of operators of energy systems who must make quick and errorless decisions. The fitness of an operator is judged by evaluation of 3 physiological indicators (EKG, skin potentials and rate of spreading of the pulse wave). Recording of these indicators are combined with psychological tests. The relationship of these physiological indicators to actual activity of the brain delineates a physiological norm from which an operator should not deviate during operation of the control panel. A report by Irene Krupenina and Boris Mazurik concerning processing of video information is mentioned briefly.  
[1889-2791]



UDC 616.61-002.151-07:616.153.962.4-097-078.73

INDIRECT IMMUNOFLUORESCENCE IN DIAGNOSIS OF HEMORRHAGIC FEVER WITH RENAL SYNDROME

Moscow SOVETSKAYA MEDITSINA in Russian No 12, Dec 84  
(manuscript received 1 Nov 83) pp 106-109

BARANOV, B. A. and GAVRILOVSKAYA, I. N., Chair of Infectious Diseases, Kuybyshev Medical Institute; Laboratory of Hemorrhagic Fevers and Research Studies, Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences

[Abstract] An indirect immunofluorescence test was designed for the diagnosis of hemorrhagic fever with renal syndrome, one of the most widely distributed endemic diseases in the USSR. The test relied on detection of antibodies in paired patient sera by fluorescein-labeled antibodies against human gamma globulin on cryostatic sections of virus-infected lungs of the bank vole. Studies on 107 patients at the Kuybyshev Medical Institute demonstrated that specific antibodies begin to increase 5-7 days after the infection, reach peak titers in 17-21 days, and then remain at a plateau. For diagnosis, paired sera obtained at days 3-6 and 17-21 should show at least a two-fold rise in titers to 1:160 or greater. In some cases with unambiguous symptomatology, lower titers (1:40 to 1:80) are acceptable for diagnostic purposes. In addition, about 4% of the cases (4/107) with hemorrhagic fever and renal syndrome may be seronegative. Figures 1; references 11: 7 Russian, 4 Western.  
[315-12172]

UDC 631.563:546.214

INFLUENCE OF PROCESSES FOR STORING FRUIT AND VEGETABLE PRODUCE ON  
BIOCHEMICAL INDICATORS OF ITS QUALITY

Minsk VESTSI AKADEMII NAVUK BSSR: SERYYA BIYALAHICHNYKH NAVUK in Russian  
No 6, Nov-Dec 84, p 110

[Synopsis of article by L. N. Zhukovskaya, V. N. Gorbatshevich and  
B. A. Tatarinov, "Influence of Processes for Storing Fruit and Vegetable  
Produce on Biochemical Indicators of Its Quality", from the Belorussian State  
University imeni V. I. Lenin]

[Text] This work presents results concerning the influence of short-term  
fruit and vegetable storage at a temperature of 5-45°C in conditions of a  
modified gas environment, ventilation and ventilation with ozone on biochemical  
indicators of the quality of produce. Experimental research was conducted  
on cucumbers, tomatoes, apples, grapes and lemons. It determined such bio-  
chemical indicators as total and reducing sugar, total acidity and the content  
of ascorbic acid and carotinoids.

Technical storing processes tried lead to a change in the content of nutritious  
substances in fruit; however, these changes are small in comparison to variety  
differences of the fruits. Ventilation with the use of ozone guarantees the  
most effective preservation of nutritious substances in produce at high  
temperatures.

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(Article published 05.07.84. Entire text 1 a 1., 11 ill., bibliography of 12  
citations)

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biyalahichnykh navuk, 1984

12473

CSO: 1840/1872

## GENETICS

### GENETICS RESEARCH IN MOLDAVIA

Moscow MOSCOW FIRST PROGRAM in Russian 21 May 85

[Text] To build a bridge between selection as a type of man's centuries'-old activity and genetics--such is the chief task of the Institute of Ecological Genetics which has been set up in the Moldavian SSR Academy of Sciences. The workers at the institute have at their disposal a biotron, an automated complex for ecological and genetic experiments. Study is carried out here on the nature of individual molecules, cells and organisms and of entire types of plants, as well as the mechanisms by which they adapt to the environment.

CSO: 1840/331-E

## GENE ENGINEERING: REVOLUTION IN BIOLOGY?

Moscow PRIRODA in Russian No 3, Mar 85 pp 24-34

GRECHKO, V. V., candidate of biological sciences, senior scientist,  
Institute of Molecular Biology, USSR Academy of Sciences

[Abstract] An attempt is made to provide a balanced presentation concerning the latest discoveries in molecular biology, primarily the result of development of the method of gene engineering and other methods closely related to it. The contribution of this science to the study of evolution is discussed. The history of gene engineering is described in popular terms. Virtually all results of studies in molecular biology obtained by gene engineering influenced the science of evolution, allowing a much deeper and broader understanding of the relationships between organisms and their genetic interconnections. The basic principles of Darwinian evolution, however, remain unshaken. The earth-shaking discoveries of molecular biology of recent years essentially represent only decoding of the specific structural elements of DNA and the mechanism of their transfer. This is important, but does not represent a revolution in the science of evolution. Figures 4; references 5: 2 Russian, 3 Western.  
[314-6508]

## LASER EFFECTS

UDC 617.7-007.681-089.844:615.849.19

### HYPOTENSIVE MECHANISMS OF LASER TRABECULOPLASTY IN OPEN ANGLE GLAUCOMA

Moscow VESTNIK OPTAL'MOLOGII in Russian Vol 101, No 2, Mar-Apr 85  
(manuscript received 10 May 84) pp 17-18

MAMEDOV, N. G., candidate of medical sciences, SHTILERMAN, A. L.,  
BATMANOV, Yu. Ye., doctor of medical sciences, and NESTEROV, A. P., professor,  
Problem Scientific Research Laboratory of Eye Microsurgery, Chair of Eye  
Diseases, Therapy Faculty, 2nd Moscow Medical Institute imeni N. I. Pirogov

[Abstract] An assessment was made of the effectiveness of argon laser therapy (80-100 coagulation spots 50  $\mu$ m in diameter, 800-1000 mW for 0.1 sec) in the management of primary open-angle glaucoma in terms of alleviating blockage of the scleral sinus. Vacuum gonioscopy conducted before and after the laser trabeculoplasty [Wise, J. B. and Witter, S. L., Arch. Ophthal., 97:319-322, 1979] to determine the degree of filling of Schlemm's canal showed that prior to the surgical procedure the results were positive in 4 cases (4 eyes), partially positive in 15 cases, and negative in 14 cases. After the procedure 12 cases were positive, 12 partially positive, and 9 remained negative. Thus, in 5 cases, laser therapy was effective in eliminating total blockage of Schlemm's canal and in improving patency in 8 cases. In addition, ocular pressure was normotensive in all patients (24) with positive or partially positive results. The mechanism evidently involved in the therapeutic efficacy of the Wise and Witter procedure rests with deblocking of the scleral sinus. References 2: 1 Russian, 1 Western.  
[312-12172]

### IS COHERENCE OF LOW-INTENSITY LASER LIGHT ESSENTIAL FOR ITS EFFECT ON BIOLOGICAL OBJECTS?

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 21 Jun 83) pp 366-371

LOBKO, V. V., KARU, T. Y. and LETOKHOV, V. S., Institute of Spectroscopy,  
USSR Academy of Sciences, Troitsk (Moscow Oblast)

[Abstract] Numerous studies have appeared reporting the beneficial effects of low intensity laser light in treatment of various diseases. The authors question whether the effectiveness of this light is related to its intensity



its color, monochromatic nature, coherence or polarization. Experiments on cell cultures in vitro are used to demonstrate that the interaction of continuous low-intensity visible light with biological molecules is definitely noncoherent. The effects related to exposure to He-Ne laser light are not laser-specific and should be considered ordinary photobiologic effects. Figures 3; references 26: 12 Russian, 14 Western.  
[1857-6508]

UDC: 616-379-008.64-06:617.735-007.281-089:615.849.19]-089.  
168-073.731

#### RHEO-OPHTHALMOGRAPHIC STUDIES OF PATIENTS WITH DIABETIC RETINOPATHY UPON ARGON LASER COAGULATION THERAPY

Moscow VESTNIK OPTAL'MOLOGII in Russian No 6, Nov-Dec 84  
(manuscript received 8 May 84) pp 24-27

MIRONOVA, E. M., candidate of biological sciences, SHPAK, A. A., candidate of medical sciences, PLYUKHOVA, O. A., junior scientist and YEDNEVA, Ya. N., physician, Moscow Scientific Research Institute of Microsurgery of the Eye, (Director-Corresponding Member of USSR Academy of Medical Sciences, Professor S. N. Fedorov), RSFSR Ministry of Health

[Abstract] A study is presented of the rheographic changes upon argon laser coagulation in patients with various versions of diabetic retinopathy (DR). The rheo-ophthalmographic studies were performed on 66 eyes of 39 patients: 32 males, 17 females. Ten were under 29 years of age, 9 were 30 to 49, 20 were over 50 years of age. In 10 patients, proliferating diabetic retinopathy was observed, requiring in 11 cases panretinal, in one, peripheral, and, in one, paravasal and local argon laser coagulation. The latter combination was also used in cases of nonproliferative DR. Rheo-ophthalmography was found to be an adequate method for studying the hemodynamic changes in DR patients after argon laser coagulation of the retina. Change in RQ during the early period up to 1.5 months after the procedure can indicate the effectiveness of laser surgery. Stabilization of DR is accompanied by persistent decrease in RQ in early and late observations. References 13: 9 Russian, 4 Western.  
[313-6508]

## MEDICINE

### NUCLEAR INSTRUMENTS IN MEDICINE. COOPERATION OF CEMA COUNTRIES

Moscow EKONOMICHESKOYE SOTRUDNICHESTVO STRAN-CHLENOV SEV in Russian No 3,  
Mar 85 pp 53-54

KHENTS, YANOSH, general director, Gamma Manufacturing Combine, Hungary

[Abstract] The Gamma enterprise is one of the oldest Hungarian manufacturers of instruments, with more than half a century of experience. The last 30 years have seen considerable development in the production of electronic instrumentation at Gamma to serve a variety of industrial and medical clients, with the latter accounting for a lion's share of the production. With the advent of nuclear medicine in the fifties, Gamma started manufacturing 15 diagnostic instruments, and the manufacturing of such equipment now accounts for most of the production. On a yearly basis more than 80% of the equipment and instruments produced at Gamma is exported to the fraternal socialist countries. For example, since the start of our 'specialization' in the nuclear field we have exported more than 480 complete isotope laboratories to the USSR. Beginning with the seventies, computer-based data processing came to the fore and led to the development of scintillation chamber diagnostic equipment, allowing for detailed noninvasive diagnostic procedures. In this connection, Gamma acquired licenses to manufacture scintillation chambers of the "Dyna Chamber 4/12" type, with the first 5 pieces of equipment turned out in 1978. To date, we have supplied more than 130 such chambers to the socialist countries, with continuous improvements being made. The success with emission tomographs has been particularly impressive, and the equipment is now undergoing trials at clinical centers. The key feature of the above equipment and instruments is that they make possible diagnostic and physiological studies under in vivo conditions. In addition, the armamentarium of in vitro, i.e., laboratory, instruments has also been considerably expanded and improved, and allows for the analysis of 100 to 256 various samples at one time. Modular equipment and instruments are under development which will simultaneously conduct measurements and evaluation of the results, with the first examples of such modules exhibited at the Budapest market in 1984. The trends and policies at Gamma are largely influenced by decisions made by Section 2 of the Permanent COMECON Commission, on Peaceful Use of Atomic Energy which deals with nuclear equipment and technology. The Section organizes regular meeting among the various experts in the field for the discussion of common interests and needs, a practice which we consider indispensable to our progress.

[1892-12172]

VISION IS SO PRECIOUS

Frunze SOVETSKAYA KIRGIZIYA in Russian 30 Apr 85 p 4

ROMANOVA, T.

[Abstract] Successful surgery involving removal of cataracts and artificial crystalline lens implantation, performed under the direction of Professor A. N. Medvedev for the first time in Kirghizia, at the republic hospital department of eye diseases, is described and discussed. A successful cataract operation which restored the sight of a miner is described briefly. The department collective performs up to 14 operations per day. Medvedev hopes for establishment of a specialized, well-equipped ophthalmology center in the future.

[1879-2791]

## MICROBIOLOGY

### EUGLENA MOTILITY AS INDICATOR OF YERSINIA VIRULENCE

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 1, Jan 85 pp 35-37

DOVGAL', G. D., Chair of Microbiology, Semipalatinsk Medical Institute

[Abstract] The effects of various Yersinia isolates on euglena motility was employed as a criterion of Yersinia virulence, and led to a simple method for virulence testing. Assessment of virulence was based on microscopic observation of the motility of euglena in a drop of culture fluid containing 10-30 of the organisms, to which is added a drop of Yersinia culture ( $10^9$  cells/ml). Cessation of motility and death of euglena occurred in 30 sec to 5 min, depending on the virulence of the isolate obtained from human and animal cases. Isolates from various environmental objects did not affect motility or lead to death of euglena. The use of euglena as a bioindicator of Yersinia virulence represents a simple and a rapid alternative to standard tests for determination of Yersinia virulence. References 2 (Russian). [1900-12172]

UDC 579.841.4--24

### GROWTH OF METHANE-TROPHIC BACTERIA IN PRESENCE OF METHANOL

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 28 Mar 83) pp 724-730

GAL'CHENKO, V. F., NAMSARAYEV, B. B., MSHENSKIY, Yu. N., NESTEROV, A. I. and IVANOV, M. V., Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Pushchino

[Abstract] A comparison of the state and growth parameters of a broad spectrum of obligate methanotrophic bacteria on media containing methanol or methanol with methane involved study of 11 strains of 7 species of obligate methanotrophic bacteria. All of the strains tested grow on methanol. The nature of growth of the bacteria depends upon their taxonomic position and upon the methanol level and carbon dioxide level in the medium. Optimum concentrations of methanol in the medium differed even for strains of the same species. The carbon dioxide level in the medium had a great effect on the growth of methanotrophs on methanol. Addition of bicarbonate (0.25 percent) or carbon monoxide (up to 10 percent) made possible growth of methanotrophs at methanol

concentrations at which they did not develop before and this increased the rate of development of other methanotrophic bacteria. Inclusion of methanol in the medium with methane increased the growth rate of *M. methanica* (type I of obligate methanotrophs) but reduced the growth rate of *M. methanolicus* (type II of obligate methanotrophs). At the same time, the methanotrophs used methane and methanol simultaneously, the carbon from which was assimilated into the biomass, carbon dioxide and organic exometabolites. Figures 5; references 20: 7 Russian, 13 Western.  
[1803-2791]

UDC 579.841.1--222

#### CHANGE OF PERIPLASMIC SPACE OF LUMINESCING BACTERIA AS FUNCTION OF LUMINESCENCE INTENSITY

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 24 Nov 82) pp 744-747

SAL'NIKOV, M. V., VYSOTSKIY, Ye. S., ZAVORUYEV, V. V. and MEZHEVIKIN, V. V.,  
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Krasnoyarsk

[Abstract] Comparison of changes of size of the periplasmic space of bacteria as a function of luminescence level and luciferase content in cells of different species of luminescent bacteria (*P. leiognathi* 54, *Beneckea harveyi* B-392, *P. phosphoreum* NCMB 1282 (ATCC 11040) and variants grown in periodic and continuous cultures is described and discussed. There was complete correlation between the size of the periplasmic space and the luciferase level in the bacteria for different species and mutant strains of luminescing bacteria under the different cultivation regimes. It was assumed that the volume of the periplasmic space does not correlate simply with the luciferase level but is determined, largely, by its quantity in the cells. Data obtained in this study definitely indicate the periplasmic location of the luminescent system. Figures 3; references 8: 6 Russian, 2 Western.  
[1803-2791]

UDC 579.873.11:575.224.42

#### NATURAL VARIABILITY OF STREPTOMYCES SPHEROIDES--PRODUCER OF EXTRACELLULAR PROTEOLYTIC ENZYMES WITH FIBRINOLYTIC ACTION

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 25 Apr 83) pp 768-771

PRYANISHNIKOVA, N. I., AL'-NURI, M. A., ASLANYAN, R. R. and YEGOROV, N. S.,  
Moscow State University imeni M. V. Lomonosov

[Abstract] A study of natural variability of *Streptomyces spheroides* M8-2, obtained by induced mutagenesis by ultraviolet rays, with further selection of highly-active variants, is described and discussed. *Streptomyces spheroides*



M8-2 subjected to this procedure exceeded the initial culture in capacity to produce extracellular proteolytic enzymes by a factor of 4-5 and produced fibrinolytic and thrombolytic effects. On some media, a population of *S. spheroides* M8-2 is split into 3 variants with different morphological and biochemical properties. The range of formation of proteolytic enzymes which hydrolyze fibrin was 3-10 units/mg of biomass; the coefficient of variability was 33 percent. Cultural and morphological differences between the variants were accompanied by differences of their protease formations. Variants I and III exceeded the initial population of strain M8-2 in proteolytic enzymes by 35 percent and 58 percent respectively. Variant II was relatively inactive. Reduction of average activity of a population during storage is caused by accumulation of type II variants in large quantities (28 percent when kept in the form of spores on fibrin agar and 37 percent when stored on corn agar). Selection on a diagnostic medium with fibrin with consideration of the hydrolysis zone around the colonies and selection of only I and III variants colonies make it possible to maintain high proteolytic activity for a long time. Figures 2; references 8: 6 Russian, 2 Western. [1803-2791]

UDC 582.232.7:579.222

#### COMPARATIVE ANALYSIS OF POLYPEPTIDE FRACTIONS AND ITS COMPARISON WITH ANTIGENIC COMPOSITION OF CYANOBACTERIA SYNECHOCOCCUS

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 16 Mar 83) pp 809-815

KOZ'YAKOV, S. Ya., RAKHMAN, M. I. and TURKEVICH, G. B., Biological Institute, Leningrad State University

[Abstract] Fractionation of proteins isolated from cell homogenates of 15 strains of cyanobacteria by vertical electrophoresis on polyacrylamide gel with sodium dodecylsulfate is described and discussed. The strains contained protein fractions having the same relative molecular weight as one of the 26 fractions found in *Synechococcus schmidlea* 670. Previous mathematical modelling was used to determine hypothetical antigens, related to antigens of strain 670, in all cyanobacteria studied. The distribution in the strains of 11 of the 18 antigens revealed, coincides with the presence of specific polypeptides in them. Probability of coincidence of 11 or more antigens and polypeptides in a group of 15 strains is of the order of magnitude of  $10^{-24}$ . Classification of the strains by numerical taxonomy methods in terms of degree of relatedness of antigenic and polypeptide compositions are similar and correspond to the taxonomy of the cyanobacteria studied on the basis of morphological and biochemical criteria. It was concluded that this method is adequate for use in finding the relative antigenic composition and can be used to associate some of the antigens revealed with specific polypeptides and thus assess the molecular organization and its variability in a group of strains of cyanobacteria being studied. Figures 2; references 19: 6 Russian, 13 Western. [1803-2791]

## PHOSPHATE AND GLUCOSE ACCUMULATION BY PSEUDOMONAS CULTURES AS FUNCTION OF THEIR RESISTANCE TO ARSENIC

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 3 May 82) pp 822-825

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Sciences; Institute of Microbiology and Virology, KazSSR Academy of Sciences,  
Alma-Ata

[Abstract] Study of phosphate transport and glucose transport in arsenite-resistant and arsenite-sensitive strains of *Pseudomonas* involved use of 2 cultures: *P. putida* 18, an arsenite oxidizing and arsenic-resistant culture and *P. aeruginosa* 561, an arsenite-sensitive culture. Labelled orthophosphoric acid ( $^{32}\text{P}$  or  $^{33}\text{P}$ ) and glucose were used to study transport and accumulation of phosphate and glucose ( $^{14}\text{C}$ ). Arsenites and arsenates have different toxic effect on transport systems of arsenic-sensitive *P. aeruginosa* 561; arsenate competes with phosphate in the overall transport system while arsenite inhibits glucose transport. Presence of arsenates and arsenites in the arsenite oxidizing *P. putida* culture did not affect phosphate transport nor glucose transport, indicating impermeability of the cell membranes for these toxic substances. Figures 2; references 9: 3 Russian, 6 Western.  
[1803-2791]

UDC 57.087.23--68(26.03)

## USE OF FLUORESCAMIN TO DETERMINE NUMBER OF MICROORGANISMS IN SEA WATER BY EPIFLUORESCENT METHOD

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 24 Feb 83) pp 850-858

POGLAZOVA, M. N. and MITSKEVICH, I. N., Institute of Microbiology, USSR  
Academy of Sciences, Moscow

[Abstract] Development of a quantitative method of counting microbial cells in sea water with the aid of a specific protein reagent, fluorescamin, is described and discussed. Fluorescamin is a highly sensitive reagent which forms fluorescent complexes with amino groups of proteins in cells. It was used to count microorganisms in sea water by the epifluorescent method. The method is easy to use and is highly reproducible. Fluorescamin is superior to acridine orange in that it does not cause nonspecific fluorescence of the background and detritus particles. The clarity of fluorescence of the stained cells does not fade for several weeks. Figures 3; references 17: 2 Russian, 15 Western.  
[1803-2791]

# CAROTINOID PIGMENTS AND INCREASED RESISTANCE OF PSEUDOMONAS METHANOLICA TO EFFECT OF ULTRAVIOLET RADIATION

Moscow MIKROBIOLOGIYA in Russian Vol 53, No 5, Sep-Oct 84  
(manuscript received 11 Oct 83) pp 861-863

NAUMOV, G. N. and BOKHAN, I. K., Northern-Caucasus Branch All-Union Scientific Research Institute of Proteins Biosyntheses, Krasnodar

[Abstract] Absorption spectra of *P. methanolica* cells and also survival rate curves after ultra-violet irradiation of pigmented and unpigmented clones of *P. methanolica* were studied to confirm the possible screening effect of carotinoids after ultra-violet irradiation. Study of absorption spectra of ethanol and acetone extracts of the cells in the 250-750 nm wavelength range revealed 2 absorption peaks at 420-430 and 500-510 nm. Pigmentation of *P. methanolica* cells does not play a role in their resistance to bactericidal action and mutagenic action of ultra-violet light at 254 nm. It is assumed that this is associated with the fact that carotinoids absorb predominantly in the visible range of the spectrum and do not screen ultra-violet irradiation. High resistance of *P. methanolica* cells to ultra-violet radiation apparently is associated with DNA reparation cellular systems. Figure 1; references 4 (Russian).

[1803-2791]

UDC 579.841.42.017.7

# COUPLING OF ORGANOTROPHIC AND LITHOTROPHIC METABOLISM IN METHANE-UTILIZING BACTERIA

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 12 May 83) pp 11-16

ROMANOVSKAYA, V. A., SOKOLOV, I. G. and MALASHENKO, Yu. R., Institute of Microbiology and Virology imeni D. K. Zabolotnyy, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] A study is presented of the capability of a number of cultures of methane-utilizing bacteria to oxidize hydroxylamine and utilize energy liberated upon its oxidation in cell metabolism. In the oxidation of ammonia by methane-utilizing bacteria, hydroxylamine is oxidized by hydroxylamine oxidase with the liberation of energy which is accumulated as ATP or utilized for the reduction of pyridine nucleotides. This active oxidation of hydroxylamine is observed in bacteria of the genera *Methylococcus*, *Methylosinus* and *Methylocystis*. Cultures in the genus *Methylomonas* oxidize hydroxylamine selectively. The rate of oxidation of hydroxylamine increases with increasing temperature of incubation of the cells. Hydroxylamine can serve as a physiological source of reducing equivalents, drawn into the reaction of monooxygenation of the hydrocarbon substrate ethane. Coupling of the process of

oxidation of hydroxylamine and ethane is illustrated by a diagram. The reaction is characteristic of *M. thermophilus*, though in other species of methane-utilizing bacteria such as *M. trichosporium*, the energy of hydroxylamine is not utilized for monooxygenation of ethane. In general the process of joint oxidation of hydroxylamine and ethane is one version of cometabolism and indicates coupling of organotrophic and lithotrophic metabolism in methane-utilizing bacteria. Figures 4; references 12: 10 Russian, 2 Western.  
[1826-6508]

UDC 550.72:579.852.11.017.7

#### BREAKING OF SILOXANE BOND IN QUARTZ BY BACILLUS MUCILAGINOSUS

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 1 Mar 84) pp 27-30

BELKANOVA, N. P., KARAVAIKO, G. I. and AVAKYAN, Z. A., Institute of Microbiology, USSR Academy of Sciences, Moscow

[Abstract] A study is presented of the growth of *Bacillus mucilaginosus* under autotrophic and heterotrophic conditions as well as conditions of biosynthesis of polysaccharides in connection with breaking of the siloxane bond of quartz. A pure culture of *B. mucilaginosus* was used with a quartz single crystal crushed to a particle size of 0.25-0.05 mm and repeatedly washed with distilled water to remove smaller particles, dried and sterilized by dry heat at 160-180 degrees C for two hours. *B. mucilaginosus* is found to be incapable of growing on the quartz without an organic substance. This indicates the bacteria are incapable of obtaining energy by breaking the siloxane bond. The breaking of the siloxane bond depends exclusively on the biosynthesis of slime, consisting of exopolysaccharides containing galactose, saccharose, mannose and small quantities of amino sugar. Figures 2; references 11: 9 Russian, 2 Western.  
[1826-6508]

UDC 579.841.04-222

#### PHOTOINHIBITION OF LUMINESCENCE OF LUMINESCENT BACTERIA

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 7 Jul 83) pp 31-35

ZAVORUYEV, V. V., VYSOTSKIY, Ye. S. and MEZHEVIKIN, V. V., Institute of Biophysics, Siberian Department, USSR Academy of Sciences, Krasnoyarsk

[Abstract] Data are presented on the effects of visible light on the luminescence of luminescent bacteria. The luminescent bacteria *Photobacterium phosphoreum* and *Photobacterium leiognathi* were used in the study. The effect of light on the bacteria was studied in a glass cultivator or a thermostated cell with intensive agitation of the bacterial suspension. Reliable



photoinhibition of luminescence of the luminescent bacteria was observed. Blue light was most effective in this process, green and red light significantly less so. Figures 7; references 11: 7 Russian, 4 Western.  
[1826-6508]

UDC 579.873.1.017.7

#### SEARCH AMONG ACTINOMYCETES FOR PRODUCERS OF PHOSPHOLIPASE C INHIBITORS

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 11 Jul 83) pp 42-48

YAKOVLEVA, Ye. P., LEVIT, Zh. D., KUZMINA, E. D., ROZHANSKAYA, T. I., ANDREYEVA, T. V. and FATEYEVA, L. I., All-Union Scientific Research Technologic Institute of Antibiotics and Enzymes for Medical Purposes, Leningrad

[Abstract] A search was made for phospholipase C inhibitor producers among the actinomycetes. The conditions under which they are grown were studied and certain properties of the inhibitor were determined. Some 410 strains of 2920 cultures of actinomycetes extracted from soil samples had no anti-phospholipase activity. Over 85% of the cultures liberated substances which suppressed the activity of phospholipase C to some extent, most having high inhibiting activity. 1072 Cultures (36.2%) had significant antiphospholipase activity, reducing the activity of the enzyme by 50-80%. The results indicated high pH- and thermal stability of the inhibitors. Inhibiting activity was not changed when the culture fluid was held for three hours at room temperature in the pH range of 4.0 to 11.5. The inhibitor in the culture fluid retained its activity when the filtrate was held for 30 minutes at 37 and 45°C., though heating to 55°C for 15 minutes halved the activity. Heating the filtrate to 90-100°C for even one minute completely destroyed the activity of the inhibitor. Figures 2; references 20: 11 Russian, 9 Western.  
[1826-6508]

UDC 579.843.4.017.64

#### INFLUENCE OF PRODUCTS OF OXIDATION OF KEROGEN ON GROWTH AND LUMINESCENCE OF PHOTOBACTERIUM FISCHERI

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 25 Feb 83) pp 89-92

DZHUNKOVSKAYA, I. P., SUKHAREVICH, V. I., SHKINKE, V. E. and VIYESTURE, Z. A., Leningrad Technologic Institute imeni Lensovet

[Abstract] Results are presented from studies of high molecular weight acids obtained by oxidative destruction of fuel shale kerogen. The acids are highly active stimulators of many vital processes in microorganisms. Studies were performed with a culture of photobacterium fischeri grown in flasks with 100 ml of nutrient medium, with rocking, at 24°C. The effect of the acids on the



luminescent bacteria was not related to growth stimulation and can thus be considered a specific influence on the synthesis of the luminescent system. The substances contained in the acids inhibit luminescence by acting on the luminescent system as mixed function oxidase inhibitors. The acids may contain small quantities of low solubility cyclic compounds. The high molecular weight acids also influence the ratio of NADH-FMN reductase and luciferase in the cells of *P. fischeri*. Figures 2; references 15: 7 Russian, 8 Western. [1826-6508]

UDC 579.843.2.23/24

#### NEW CHROMIUM-REDUCING GRAM-VARIABLE BACTERIUM WITH MIXED FLAGELLATION

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 19 Aug 83) pp 83-88

KVASNIKOV, Ye. I., STEPANYUK, V. V., KLYUSHNIKOVA, T. M., SERPOKRYLOV, N. S., SIMONOVA, G. A., KASATKINA, T. P. and PANCHENKO, L. P., Institute of Microbiology and Virology imeni D. K. Zabolotnyy, UkSSR Academy of Sciences, Kiev; Novocherkassk Polytechnic Institute

[Abstract] A new bacterium reducing highly-toxic ions of hexavalent chromium has been isolated from industrial wastewaters. The new bacterium has gram-negative type cell wall, facultative anaerobiosis, heteromorphism of cells, instability of gram stain and mixed flagellation method. This work presents results from studies of the properties of the bacterium and a determination of its systematic position. It is identified as a new species, *Aeromonas dechromatica*, coccoid and rod-shaped cells with rounded ends diameter 0.5-0.6 micrometers, length up to 15 micrometers. The cells undergo transformation from coccus to rod or rod to coccus. Colonies on agar are small, transparent, smooth, shiny becoming yellow with age. In liquid media, the cells grow in dispersions causing the medium to become turbid. The color of a medium containing  $\text{Cr}^{6+}$  changes from yellow to bluish. The cells grow at 4 to 45°C, optimum 34°C, pH 5.9-9.0, optimum 6.8-7.0. Figures 3; references 20: 6 Russian, 14 Western. [1826-6508]

SPECIFICS OF OXIDATION OF  $\alpha$ -METHYLSTYRENE BY BACTERIA OF THE GENUS PSEUDOMONAS

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85  
(manuscript received 18 Jul 83) pp 136-140

DZHUSUPOVA, D. B., BASKUNOV, B. P., GOLOVLEVA, L. A., ALIYEVA, R. M. and ILYALETDINOV, A. N., Institute of Microbiology and Virology, Kazakh SSR Academy of Sciences, Alma-Ata; Institute of Biochemistry and Physiology of Microorganisms, USSR Academy of Sciences, Moscow

[Abstract] The purpose of this work was to isolate microorganisms capable of growing on  $\alpha$ -methylstyrene (AMS), widely used in the production of divinyl-methylstyrene-type rubber, to study means of its oxidation and the physiological and biochemical specifics of active cultures. Screening of active AMS destructor strains among collections including representatives of the genera *Bacillus*, *Pseudomonas*, *Caulobacter*, *Flavobacterium*, *Arthrobacter*, *Alcaligenes* and *Enterobacter* yielded no positive results. Direct precipitation from the wastes of rubber production plants and  $\alpha$ -methylstyrene tanks yielded three cultures, associated by morphologic-cultural and physiologic-biochemical characteristics with the genus *Pseudomonas*. Two were considered to be *Pseudomonas aeruginosa*, one *P. acidovorans*. The latter oxidized  $\alpha$ -methylstyrene only to acetophenone, the *P. aeruginosa* cultures assimilating the compound entirely. Analysis of the intermediate products of oxidation of AMS by the two strains which assimilated completely and study of key enzymes of oxidation of the aromatic ring indicate that AMS is oxidized by these strains according to a new and previously unknown path. Further and more detailed studies of this suggestion are required. Figure 1; references 13: 2 Russian, 11 Western.  
[1826-6508]

## MICROORGANISMS IN SPACE FLIGHT

Moscow MIKROBIOLOGIYA in Russian Vol 54, No 1, Jan-Feb 85, pp 169-172.  
Review of "Mikroorganizmy V Kosmicheskom Polete", edited by K. M. Sytnik, Kiev Nauk Dumka Press 1983, 154 pages

MURZAKOV, B. G.

[Abstract] This book describes the results of experiments involving developing cultures yielding new information on the influence of extremal factors on living cells. The reviewer describes the contents of each of the chapters in the book; chapter 1, the current stage of development of space microbiology; chapter 2, specifics of preparation and performance of experiments in space microbiology; chapter 3, influence of space flight factors on the growth, development and mobility of *P. vulgaris*; chapter 4, ultra-structural organization of cells as an indicator of the influence of space flight factors on

living systems; chapter 5, ultra-structure of proteus vulgaris cells with various methods of cultivation under space flight conditions; chapter 6, microbiological study of various strains of chlorella grown under space flight conditions; chapter 7, ultra-structure of chlorella cells grown under space flight conditions; and chapter 8, basics of restructuring of eukaryotic cell in space flight. This book is said to be one of the most complete publications presenting factual material on the influence of actual space flight conditions on developing microorganism cultures.  
[1826-6508]

## MILITARY MEDICINE

### KYUKOVO HOSPITAL FOR VETERANS

Moscow KRASNAYA ZVEZDA in Russian 13 Apr 85 p 4

MAMCHUR, Yu., captain

[Abstract] The excellent medical care that is given to the veterans of the Great Patriotic War is exemplified by the staff and facilities of the Kryukovo Hospital. Some forty years after the end of the war, the ravages of the war are still evident in the faces of the veterans and the wounds and diseases from which they still suffer. A course of treatment at the hospital generally takes months, but the time and care devoted to these patients is of no concern. The 500-bed hospital serves more than 60,000 war invalids in the Moscow, Orel and Belgorod Oblasts, with requests for care coming from other oblasts and krays on a daily basis. The hospital and its staff are a living monument to the commitment that the Soviet people have made to take care of those who served the fatherland so selflessly.  
[308-12172]

### PROTECTING AND IMPROVING HEALTH OF YOUNG SERVICEMEN

Moscow KRASNAYA ZVEZDA in Russian 7 Apr 85 p 4

[Abstract] This article, entitled "Physical Conditioning In Youth" describes an interview with Lieutenant General, Medical Service, Ye. Gembitskiy, Chief Internist of the USSR Ministry of Defense, corresponding member, USSR Academy of Medical Sciences, who describes measures being taken to preserve and improve the health of Armed Forces members. Life and health of servicemen are protected in all aspects of living. Gembitskiy emphasizes the importance of proper nutrition and reports that physiological standards for caloric intake and vitamin intake are being met in all branches of the military. Medical aid stations of a military chast' play a major role in medical protection and disease prevention. Special attention is given to physical conditioning of servicemen in the chast' and aboard ship and good health habits are encouraged. These measures have reduced overall morbidity among enlisted men by 15 percent in the last 6 years. Army life improves the health and moral character of youth. Prophylactic care for servicemen is excellent. Regular physical examinations protect the health of servicemen and prevent disease. Special measures are taken to try to detect premorbidity. The level of health of servicemen is at the highest level since World War II.  
[307-2791]

## MOLECULAR BIOLOGY

### PHYSICAL LABELS IN MOLECULAR BIOLOGY

Moscow PRIRODA in Russian No 3, Mar 85, pp 72-81

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USSR Academy of Sciences

[Abstract] This popular article discusses how physical labels, atoms of matter with physical properties such as radioactivity which can be easily detected, can be used to perform such tasks as determination of the mutual placement of active centers in molecular biology. A paramagnetic compound with an odd number of electrons can be used as a spin label to solve structural and dynamic problems of molecular biology. Other examples of the use of detectable physical phenomena in the solution of problems of molecular biology are noted. Continued development of labels and probes for the solution of such problems is predicted. Figures 6; references 15: 10 Russian, 5 Western.  
[314-6508]



## NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

### EFFECT OF HIGH-FREQUENCY ELECTROMAGNETIC FIELD ON ISOLATED SNAIL BRAIN

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 8 May 84) pp 354-356

BOL'SHAKOV, M. A., Institute of Biological Physics, USSR Academy of Sciences, Puschchino (Moscow Oblast)

[Abstract] A study was performed on the isolated central nervous system of *Lymnaea stagnalis*, irradiated in a rectangular waveguide by a laboratory oscillator with output power of 30 W at 0.9 GHz. The electrical activity of the neurons was visually monitored on an oscilloscope and recorded by a strip chart recorder. Experiments were performed at 18-21°C. A decrease in the frequency of spontaneous electrical activity during minutes 1-3 was observed, resulting from the thermal effect of the field. Figures 2; references 4: 2 Russian, 2 Western.  
[1857-6508]

UDC 591.145.3:595.44

CHANNEL-FORMING ACTION--COMMON PROPERTY OF THERIDIIDAE (ARANEI) FAMILY  
SPIDER VENOMS

Moscow BIOLOGICHESKIYE NAUKI in Russian No 2, Feb 85  
(manuscript received 25 Jan 84) pp 30-33

KAZAKOV, I., NENILIN, A. B., USMANOV, P. B. and TASHMUKHAMEDOV, B. A.,  
Institute of Biochemistry, Uzbek SSR Academy of Sciences

[Abstract] The effect of the venom of ten species of spider from the family Theridiidae on bimolecular lipid membranes was studied. The venoms of *Lactrodectus mactans tredecimguttatus*, *L. pallidus* and *Steatoda paykulliana* were used as aqueous extracts of the venom gland, while the venoms of *Achaearaneatepidariorum*, *Epsinus* sp., *S. bipuncta*, *S. triangulosa*, *Theridion impressum*, *Th. varians*, and *Th. sp.* were obtained as homogenates of the venom gland. All venoms changed the permeability of a bimolecular lipid membrane, forming conduction channels for cations. The venom of 35 other species of spider, including those in the families Araneidae, Linyphiidae, and Tetragnathidae, which are phylogenetically close to Theridiidae, did not possess this property. Therefore, the ability of the venom to cause the formation of cation-selective channels in bilayer lipid membranes can be used as a diagnostic characteristic of the family Theridiidae. This property appears in spiders of both sexes and all ages. References 17: 9 Russian, 8 Western. [1868-12126]

UDC 577.151.083

THROMBIN-LIKE ENZYME FROM AGKISTRODON BLOMHOFFII VENOM

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR: SERIYA B. GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 85  
(manuscript received 22 Oct 84) pp 79-82

UGAROVA, T. P., MEL'NIK, V. N. and GORNITSKAYA, O. V., Institute of Biochemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Standard Pharmacia (Sweden) reagents were used for the isolation and purification of a thrombin-like enzyme from the venom of the poisonous snake *Agkistrodon blomhoffii* by a series of steps involving ion-exchange chromatography, gel filtration and affinity chromatography. On the basis of

SDS polyacrylamide gel fractionation the component of interest was found to have a MW of 36000  $\pm$  1000 and, on the basis of Schiff's reaction, was identified as a glycoprotein. The final product had an activity of 213 NIH U/opt. U. The activity of the product consisted of cleavage of the A peptide of the fibrinogen molecule with the formation of fibrin-desAA. Figures 3; references 11: 4 Russian, 7 Western.  
[1904-12172]

UDC 591.044

#### HYPOTENSIVE ACTIVITY OF NITROSYL NONHEME IRON COMPLEXES WITH VARIOUS ANIONIC LIGANDS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 3, Mar 85  
(manuscript received 17 Jul 84) pp 742-744

VANIN, A. F., KLESHCHYEV, A. L., MORDVINTSEV, P. I. and SEDOV, K. R., Full Member, USSR Academy of Medical Sciences, Institute of Chemical Physics, USSR Academy of Sciences, Moscow, Irkutsk State Medical Institute

[Abstract] The hypotensive activity of dinitrosyl iron complexes with cysteine, thiosulfate or phosphate was studied in white rats, measuring complex concentration by electron paramagnetic resonance (EPR). All the complexes studied lowered arterial blood pressure in a dose-dependent manner. This effect was not obtained with the individual components of the complexes or with a saturated solution of nitric oxide. All the complexes exhibited less maximal arterial pressure depression than nitroprusside, but the duration of effect was longer. With the thiosulfate complex, arterial pressure had not returned to initial levels after three hours. EPR of blood, liver, kidney, and heart demonstrated the transfer of Fe-NO groups from the complexes to protein, indicating that the hypotensive effect may be due to the transfer of NO to guanylate cyclase in vascular cells. The protein-Fe-No complex serves as a depot for nitric oxide in the tissues, leading to the prolonged hypotensive effect. The complexes may also affect other physiologic systems which are connected with the activation of guanylate cyclase. Figures 1; references 15: 2 Russian, 13 Western.  
[1846-12126]

MEMBRANE ACTIVITY OF CHOLESTEROL-DEPENDENT CYTOLYSINE OF BACILLUS CEREUS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 3, Mar 85  
(manuscript received 14 Jun 84) pp 302-309

KRASIL'NIKOV, O. V., USMANOVA, A. M., SABIROV, R. E., TASHMUKHAMEDOV, B. A., YEZEPOCHUK, Yu. V. and BITSAYEV, A. R., Institute of Biochemistry, Uzbek SSR Academy of Sciences, Tashkent; Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] *Bacillus cereus* produces several protein components which have cytolytic activity. The most active is cereolysin, a thiol-dependent toxin whose activity greatly decreases in the presence of cholesterol. This work presents data on the influence of cereolysin extracted from *B. cereus* on biological and artificial membranes. The data indicate that the hemolytic effect of cholesterol-dependent cereolysin from *B. cereus* is directly related to its capability to form ion conductivity channels in cholesterol-enriched membranes. Figures 8; references 24: 9 Russian, 15 Western.  
[1856-6508]

SENSITIVITY AND ACCURACY OF HUMAN 'PHYSIOLOGICAL THERMOSTAT'

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 3, Mar 85  
(manuscript received 7 Jun 84) pp 753-757

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[Abstract] The error associated with the reestablishment of internal human body temperature after the introduction of 60-80 cal/kg was measured. The heat was introduced by means of a drink of 51-54°C water. Body temperature was monitored with a highly accurate gradient calorimeter, at the wrist, as well as conventionally at the tympanic membrane, forehead, chest, and forearm. Vasodilation in the wrist coincided with increased average body temperature, and with increased tympanic membrane and skin temperatures. Vasodilation continued after tympanic membrane temperature fell below its initial value. At the end of vasodilation average body temperature differed from the initial value in 19 of 22 experiments, with both positive and negative deviations seen. The greatest deviation was 0.12°. Only half of the observations had deviations greater than 0.06°, previously established as the sensitivity of the physiological thermostat to changes in temperature. The convergence of temperature signals on one neuron in the thermoregulatory center may be one of the mechanisms associated with the high sensitivity and accuracy of the human physiological thermostat. Figures 1; references 9: 6 Russian, 3 Western.  
[1846-12126]

SLEEP PEPTIDES: REALITY AND HYPOTHESES

Moscow ZNANIYE--SILA in Russian No 3, Mar 85 pp 17-19

KOVAL'ZON, V., candidate of biological sciences

[Abstract] Considerable attention has been focused recently in the popular press on the so-called sleep peptides, small molecules that supposedly can induce restful sleep and are useful in the treatment of insomnia. Such peptides have been found to modify the action of serotonin in various areas of the brain. Serotonin is a chemical that transmits nerve impulses and has been implicated in the mechanisms of normal sleep. However, things became



complicated when the active sleep-inducing peptide has been identified as a muramyl peptide, a component of many bacterial cells. The question arose: Are these peptides produced by the animal body itself, or do they come from bacteria in the body? While these problems are as yet unresolved, it is interesting to note the studies carried out in the USSR along these lines. Such peptides have been synthesized and studied by our group at the Institute of Evolutionary Animal Morphology and Ecology imeni A. N. Severtsov, USSR Academy of Sciences, and by V. T. Ivanov at the Institute of Bioorganic Chemistry imeni M. M. Shemyakin of the Academy, as well as by other Soviet investigators (T. M. Andronova et al.). To date, the soporific effects of the muramyl peptide have not been reproduced by the Soviet researchers in rabbits, although sleep-like states have been observed. Consequently, there is no firm scientific basis confirming the soporific properties of muramyl peptide, reported by Pappenheimer in 1982 in the USA. The controversy surrounding sleep-inducing peptides goes some years back, however. In 1977 a formula was published for a nonapeptide (peptide made up of 9 amino acids), designated Delta Sleep-Inducing Peptide (DSIP). Suffice it to say, that only the DSIP provided by the researchers, claiming original isolation and synthesis, works in experimental and clinical settings, while that synthesized by other investigators fails to do so. Why? It must be remembered that in capitalist countries most of such research is sponsored by private for-profit enterprises, who expect a financial return on their largesse. The suspicion is strong that the formula that was published was deliberately misleading to prevent others from reproducing the peptide and, therefore, threatening the financial gain of the sponsoring pharmaceutical firm. Soviet researchers, however, have prepared analogs of DSIP to get at the truth, and some of them do indeed have soporific properties. The facts about the roles of peptides and delineation of their function in normal and pathological sleep is slowly being unraveled. Their study will help us not only to regulate sleep and its disorders, but also to understand the nature of sleep and its role in the body's physiological economy.

[1874-12172]

UDC 577.3

# CEREBRAL MITOCHONDRIAL MEMBRANE STATUS UNDER STRESS AND ITS CORRECTION BY MEDICATION

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 27 Sep 83; after revision 23 Apr 84) pp 306-308

KRESYUN, V. I., Odessa Medical Institute imeni N. I. Pirogov, Ukrainian SSR Ministry of Health

[Abstract] Experiments were performed on rats preselected as the most highly emotional of a larger initial test group. The experiments involved twelve-day chronic emotional-pain stress reproduced as alarm neurosis by a combination of immobilization with electric skin irritation. Chronic emotional-pain stress resulted in sharp depression of tissue respiration and oxidative phosphorylation, accompanied by a decrease in the content of macroergic phosphates,

particularly ATP, a depression in ATPase in the brain and a number of tissue respiration enzymes. The major cause of depression in cerebral bioenergetics under emotional-pain stress was found to be disruption of the structure and, consequently function of the mitochondria, based on dyscoordination of the lipid-protein system of the membranes, leading to a change in their functioning. Nicotinic acid derivatives were found to be effective in treating the condition. References 5: 4 Russian, 1 Western.  
[1857-6508]

#### CHANGE IN STATIC ELECTRIC FIELD UPON FIXATION OF ANIMAL

Moscow BIOFIZIKA in Russian Vol 30, No 2, Mar-Apr 85  
(manuscript received 1 Sep 84) pp 361-362

ZATSEPINA, G. N., ILYIN, Ye. A. and LASAREV, A. O., Institute of Medical-Biological Problems, USSR Ministry of Health, Moscow

[Abstract] The static electric field was studied by recording potential differences on the skin surface of 26 male Wistar rats immobilized by tying all four paws down. The results show that immobilization of the animals caused a change in the static electric field, the characteristic of which varied, being not the absolute values of potential differences but their changes upon change in the status of activity of the animal. Figure 1; references 2 (Russian).  
[1857-6508]

UDC 577.35:576.32/.34

#### cAMP-DEPENDENT PROCESSES AND MECHANICAL SENSITIVITY OF ABDOMINAL SENSORY ORGAN OF SCALLOP PATINOPECTEN YESSOENSIS (JAY)

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 2, No 3, Mar 85  
(manuscript received 15 Aug 84) pp 285-291

ZHADAN, P. M. and DOROSHENKO, P. A., Pacific Ocean Institute of Oceanography, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok; Institute of Physiology imeni A. A. Bogomolets, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] There are at present, practically no data indicating the presence of cyclic nucleotide metabolic system enzymes in the mechanoreceptors of hairs. In a previous work the authors demonstrated that the addition of the cAMP-phosphodiesterase activity inhibitor theophyllin to sea water surrounding the abdominal mechanosensory organ increased its mechanical sensitivity. This article presents results of a more detailed study of the role of cyclic nucleotides such as cyclic adenosine monophosphate in the mechanism of perception of mechanical stimulus by the receptor cells of this sensory formation and its transformation to an electric signal. The results, indicating the participation of cAMP and cAMP-dependent phosphorylation in the process of

transformation of a mechanical stimulus to a bioelectric response by the mechanosensory cells of the abdominal organ, indicate that this object can be used for future physiological and biochemical studies of the role of cyclic nucleotides in mechanoreception. Figures 6; references 27: 7 Russian, 20 Western.  
[1856-6508]

## BRIEFS

**NEW HEALTH CENTER--TASS, Leningrad Oblast--**On the outskirts of the village of Bolshoye Zamostye in Leningrad Oblast a new sanatorium and preventive care clinic has been built, and workers at the Leningrad Sovkhoz Association have received the first passes to visit the clinic. The health center was built alongside other new projects--a multi-department polyclinic and a pharmacy. The rural medical complex was built on the basis of a voters' mandate and was included in the plan for the association's economic and social development. The association's deputies directed that over 3000 rubles from sovkhos funds be allocated for the planning and construction of the health center. Every year approximately 1000 machinery operators, animal husbandry workers, and crop farmers will undergo treatment here. The three-story building contains hydropathic facilities, physical therapy and electrical treatment rooms, solariums, and a therapeutic gymnastics room. The guests are provided with comfortable hotel rooms, lounges with color televisions, and a dietic cafeteria. [Text] [Moscow IZVESTIYA in Russian 22 Apr 85 p 2] 9967

**CARDIOLOGY CENTER OPENS--**The Republic Cardiology Clinic, built with funds collected from volunteer Saturday work days, opened on 11 May in the capital of Turkmenistan. This large cardiology center contains therapeutic and cardiac surgery departments, cardiac stimulation and resuscitation units, a number of laboratories, and treatment rooms. Patients suffering from cardiovascular diseases from all the republic's cities and rayons will receive skilled medical care here. The establishment of this type of center represents a new stage in the development of cardiology services in Turkmenistan. The conditions have been created here for broad application of the latest methods in the diagnosis and treatment of cardiovascular diseases. The new specialized medical institution will be an organizational, coordinating, teaching, and methodological center for all the cardiology treatment institutions. The staff will conduct research on cardiovascular diseases and on the development of treatment methods that take into account the region's climatic conditions. Speaking at the opening of the center, M. Mollayeva, secretary of the Central Committee of the Communist Party of Turkmenistan, congratulated the medical staff and cut a red ribbon at the entrance to the four-story clinic building. Those attending the opening ceremony included R. A. Bazarov, deputy chairman of the republic Council of Ministers, and Ye. Ovlyakuliyev, chief of the Science and Educational Institutions Department of the Turkmenistan Communist Party Central Committee. [Text] [Ashkhabad TURKMENSKAYA ISKRA in Russian 12 May 85 p 3] 9967

GRODNO CARDIOLOGISTS--Every condition necessary for cardiologists has been created in Grodno. An oblast cardiology clinic has recently begun operating here. Light, spacious wards and offices are provided with modern equipment. It is entrusted to highly trained specialists, who do everything possible to help people. Dozens of patients have already returned home after recovering, grateful for the help of physicians G. I. Fadeyev, B. I. Pochebut, Ye. I. Samoletov and G. V. Shkutko, nurses V. Lovgal, M. Zaytseva, M. Baranovskaya and others. In the photos [not reproduced]: oblast cardiology clinic; in the intensive care ward: physician Ye. I. Samoletov, cardiology department head G. I. Fadeyev and nurse V. I. Lovgal; above: nurse Marina Zaytseva. [Text] [Minsk SOVETSKAYA BELORUSSIYA in Russian 14 Apr 85 p 2] 11052

CSO: 1840/1914



## MEASURES TAKEN TO IMPROVE HEALTH CARE

Frunze SOVETSKAYA KIRGIZIYA in Russian 4 May 85 p 3

[Article by A. Karypkulov, secretary of the Kirghiz CP Central Committee, under the rubric: "Party Concern for Health Care": "A Search With a Positive Outcome"]

[Text] Today managers at every level and in every sector of the national economy must have businesslike qualities, such as competence, a sense of the new, initiative, the courage and willingness to take responsibility, and the ability to set and meet goals. And as M. S. Gorbachev stressed at the April Plenum of the CPSU Central Committee, they must also have a desire to learn how to work.

These businesslike qualities are also needed to resolve the complex, important tasks involved in improving medical services for the public. New reserves must be sought, along with ways to strengthen the material base of health care and to make efficient use of available resources.

For all of us the preparations for the 27th CPSU Congress include a serious analysis of what has already been accomplished, and this is a time of intensive, diverse labor; the April Plenum of the CPSU Central Committee made an appeal to communists for this type of labor.

Our republic is mountainous, with developed animal husbandry. In the winter thousands of nomadic shepherders travel with their flocks to spots that are difficult to reach, but they are not left without medical supervision. Preventive medical examinations, and when necessary, treatment, are provided before they go to their wintering areas. Physicians make regular visits to the pastures in helicopters.

This is how it used to be. Last winter, however, some changes were made in the medical services system that had been operating for years: medical researchers were included in the teams of physicians. Specific groups of researchers were assigned to various pasturing regions, and after a thorough analysis and investigation of the situation, they were supposed to make concrete recommendations for further improvements in prevention and treatment work with the livestock herders, and for improving their working and living conditions.

In all honesty, five years ago these steps would have seemed excessive not only to the researchers, but also to those responsible for organizing health care, who had a far from clear understanding of how to make practical use of the republic's ever-increasing scientific potential.

The goals set by the party in the area of improving health care required that the physicians not just make improvements on a small scale, but that they introduce fundamental, large-scale innovations that would help us move decisively toward the important goal of annual medical examinations for the entire population.

Today the Kirghiz SSR has a vast network of medical treatment and prevention institutions; there are about 2000 such institutions employing a total of 12,000 physicians and 31,000 middle-level medical personnel. This means that people living in any populated area can receive medical care in a minimum amount of time.

In addition to the clinics and multi-department republic and oblast hospitals with highly specialized departments, there are six scientific research institutes. There is a medical institute as well. Last year a medical school for improving the skills of middle-level medical personnel was opened. This institution will make it possible to increase the retraining by a factor of 2.5.

There is a material base and personnel available for new improvements in the medical services provided to the public. New forms of work are needed. This is the direction that party organizations are taking in their search.

The City "Health" Office has been operating under the Frunze City Party Committee for several years already. The secretary of the city party committee is in charge of this office. This coordinating center includes managers of almost 30 of the city's largest enterprises, directors of various public organizations, and of course, physicians. These people work together to determine ways to improve public health.

We are convinced that this is an effective method, and we have recommended that it be implemented on a widespread basis. A health care program has also been worked out already for the city of Rybachye.

I would like to point out that thanks to the influence of party organizations, there has been a marked increase in the attention given by managers to protecting the health of the workers. In the past five-year plan alone five sanatorium and preventive care clinics and rest centers were opened, with a total of 750 beds. More than 20 projects have been built using centralized sources of financing.

Recently the Central Committee of the Kirghiz Communist Party approved a plan for the construction and reconstruction of out-patient and in-patient medical centers using local budget funds and funding from kolkhozes and sovkhoses.

I regret to say that erection of our planned health care projects is still proceeding at a slow pace. There have been some positive changes, but party

organizations need to make greater efforts to overcome these delays more rapidly.

Protecting the health of women and children is the focus of special concern on the part of party committees. This is not surprising since our republic has a high birth rate and a large proportion of women who have given birth to many children, which means that they and their children need to be given special attention. Last year alone the Central Committee of the Kirghiz Communist Party and the government of the republic issued two decrees on these issues. Pediatric departments have been broken up into smaller units, six additional pediatric first aid teams have been organized, resuscitation units have been set up in large central regional hospitals, and there are intensive care units in all the other hospitals. At a number of children's clinics there are special wards where both the child and the mother can be treated at the same time.

A comprehensive special program aimed at improving medical care for infants under two years of age and for their mothers has been developed and is being implemented; the purpose of this program is to reduce the incidence of illness and mortality in this group. In reviewing this program, the Central Committee of the Kirghiz Communist Party focused special attention on the role of science. There was serious criticism of the republic's Obstetrics and Pediatrics Scientific Research Institute and the Medical Institute.

The Central Committee of the Kirghiz Communist Party is directing party organizations at institutes to work very closely with organizations engaged in practical health care. Current experience shows that a simple increase in the personnel and material potential is not enough to bring about a corresponding improvement in medical care and to meet the party and government's goal of providing annual medical examinations for the entire population.

An increase in the effectiveness of medical measures and intensive utilization of the material base depends to a great extent on a scientific approach and on the initiative of both scientists and health care administrators, in addition to the understanding and support provided for this initiative by party and public organizations. Here is an example. Last year the collective of the Taldy-Suyskiy District Hospital in Tyupskiy Rayon started a preventive health care system for the entire population. They were aided in this project by scientific organization of labor.

This hospital was joined by party and soviet organs in organizing a republic-wide seminar for health care workers. This seminar had some definite results. Health care personnel in At-Bashinsky and Toktogulskiy rayons, and in a number of rayons in Issyk-Kul Oblast followed this example.

Not everyone, however, gave the proper attention to spreading scientific organization of labor; personnel in some places only introduced separate elements of this plan, and sometimes this was done in departments that are of secondary importance. This approach does not provide the desired results. Apparently not all chief physicians have a sufficiently developed sense of responsibility, and do not have the proper perspective on their work and a sense that they need to take a creative approach to it.

In the last years of the five-year plan medical institutions in Kirghizia have improved their operations significantly. Six of them have earned the important title of collectives of communist labor, and six have earned the title of collectives of high culture. The Chon-Alayskiy District Hospital, the Chuyskiy Central Rayon Hospital, and the Osh Oblast Hospital, among others, were winners in the All-Union socialist competition.

Physicians in the republic are meeting the 27th CPSU Congress with strong indicators. There is a large reserve for making further improvements in health care. The Central Committee of the Kirghiz Communist Party is directing health care workers to work more energetically to incorporate the practices of the best workers, to take a comprehensive, long-range approach to resolving large-scale problems, and to see that all physicians do an honorable job of performing their duty to protect the health of the people in the republic.

9967

CSO: 1840/1914

CONGENITAL HEART DEFECTS IN ORGANIZED CONTINGENT OF ASHKHABAD CHILDREN  
AND ADOLESCENTS

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 6, Jun 84 pp 7-8

[Article by N. M. Tachmuradov, K. Amanepesov, M. T. Abdurakhmanov, R. Ch. Dzhorayev, V. N. Rodin and B. N. Tachmuradov, of the Department of General Surgery (Director Prof. N. M. Tachmuradov) of the Turkman State Medical Institute (Rector Prof. N. N. Nurmamedov), Institute of Physiology and Experimental Physiology of the Arid Zone (Director, Cand. Med. Sci Ye. P. Serebryakov) of the TSSR Academy of Sciences]

[Excerpts] The epidemiological aspects of title pathology have not been adequately explained in the literature, although the precise determination of specific weight, and the early discovery and timely referral for surgical treatment of children suffering congenital heart defects are of great importance for practical public health care.

We conducted an epidemiological investigation of 44,564 organized children (22,326 boys and 22,238 girls). Their ages were as follows: up to 6 years--12,745, 7-10 years--12,279, 11-15 years--12,866, and 16 years and older--7,674. The ethnic composition was 20,003 Turkmens, 16,746 Russians, 2,973 Armenians, 2,205 Azerbaijanis, and 2,634 others.

Group I contained 619 children with functional systolic noise. Group II contained 122 children with the after-effects of rheumatic fever, with little or no indication of the disease still being in progress. Group III contained 205 children with clear symptoms of congenital heart defects.

The most frequent form of heart defect among those studied turned out to be septal defects and open arterial flow, which corresponds to data in the literature. More than 50 percent of the patients were children up to 10 years (up to 6 years--73, 7-10 years--59, 11-14 years--51, 15 years or older--22). There were no differences found with respect to sex or ethnic group.

According to data from our study, the frequency of congenital heart defects among an organized contingent of Ashkhabad children was 0.46 percent.

Every year approximately 35,000 children with this pathology are born in our country [1], 60-70 percent of whom die in early infancy. Timely surgical correction makes it possible to save more than 60 percent of the children.



The above data are evidence that the relevance of this problem is related not only to the high frequency of congenital heart defects but also to the high mortality due to such defects in early childhood. This therefore calls for the early detection of such patients, the precise determination of a topical diagnosis using special methods of investigation, and timely surgical treatment.

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CSO: 1840/1905

## HEALTH STATUS OF SOVIET YOUTH

Moscow IZVESTIYA in Russian 7 Apr 85 p 3

TUTORSKAYA, S.

[Abstract] This article entitled "Replacement for the Elders", published on the occasion of the World Day of Health, reports an interview with Galina Nikolayevna Serdyukovskaya, director of the Scientific Research Institute of Hygiene of Children and Youth, academician, USSR Academy of Medical Sciences. G. Nikolayevna reports that most Soviet youths ranging in age from 14-19 years are harmoniously developed without serious health problems. She attributes this situation to the socialist way of life. A few youths are in poor health because of a sedentary life style and excessive televiewing. Sedentary habits are promoted by the schools; when a child goes from kindergarten to school his motor activity is halved. More emphasis must be placed on physical education. Specialists at the Scientific Research Institute of the Hygiene of Children and Youth have developed new methods of teaching physical culture based on study of the physiological features and potentials of teen-agers and youths. Institute scientists are participating in development of occupational education programs. An interdepartmental system of vocational guidance has been created. Objective psychophysiological and medical criteria regarding the age at which a youth is ready for a given occupation are being developed. Rules for training youths for 1,600 occupations have been developed and should be introduced into the school program. Students have unique health problems. Difficulties in adaptation occur most frequently in first year student and the highest incidence of illness occurs in this period. Morbidity then declines and efficiency increases. Reduction of work load for first year students as recommended. There is a difference in incidence and type of morbidity found in students at technical schools and students studying in the humanities. Medical and social advantages enjoyed by the present generation are presented. [1880-2791]

## PROCEDURAL RECOMMENDATIONS--ONE OF POPULAR FORMS OF INCORPORATION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 1, Jan 85 pp 20-21

[Article by E. K. Akhanova and M. A. Tusupbayeva, Scientific Medical Council, Kazakh SSR Ministry of Health]

[Text] There is no doubt that the incorporation of scientific achievements into the practice of public health increases the potential and efficiency of the work of preventive medical treatment institutions. However, until now, there has been no unanimous opinion in the literature concerning the most optimal form of incorporation. In order to investigate this question we sent a specially-drawn-up questionnaire to all oblasts of the republic. Nine hundred and sixty of those surveyed responded. In so doing, procedural recommendations were named one of the most popular forms of incorporation.

In order to study this issue in depth, we participated in the survey conducted by the USSR Academy of Medical Sciences. The questionnaires consisted of 16 questions, whose answers helped to analyze the stages of incorporation.

It turned out that the overwhelming majority of practicing physicians (96%) were extremely interested in the work of medical scientists in a specialized field of medicine. The incorporation of new methods of diagnosis, treatment and prevention depends on the personal qualities, erudition and initiative of the physician (67%). The physician's interest in innovation is of significant moment.

Seventy-four percent of the respondents considered incorporation their duty, 41% obtained from it moral satisfaction, 22% incorporated new procedures at the request of their institution's managers and 1% did not incorporate new procedures because of a lack of such requests.

What prevents scientific achievements from being incorporated into practice?

The majority of those who responded to this question referred to material and technical difficulties and difficulty with personnel (36%), to the impossibility of providing training in the new procedure (20%) and to organizational difficulties (9%). Four percent of the respondents are awaiting the "instructions of an immediate supervisor" for fear of being unsuccessful.

Such channels of incorporation as courses for increasing qualifications (51%), information seminars at work (18%), and congresses, conferences and symposiums (26%) continue to be of great significance. The role of the scientific press in incorporation has significantly increased (the publication of monographs, articles, etc.).

Why are the developed procedures and methods no longer being incorporated? Sixty percent of the respondents noted the lack or incompleteness of necessary pharmaceuticals, instruments and devices. Of some significance (38%) is the number of physicians who do not obtain the desired effect set forth in the procedural recommendations and 13% even mentioned a deterioration in the results for which a new procedure or method was used.

We consider important the investigation of the question concerning the needs of practical public health employees regarding diagnoses, treatment and prevention. The majority of the respondents (69%) referred to a need for diagnostic methods, 63% for treatment methods, 41% for rehabilitation methods, 28% for the organization of preventive medical treatment, 22% for preventive methods and 15% feel the greatest need for medicosanitary education.

To the question, "If you were to incorporate new procedures and methods into your work, from which sources would you obtain information about them?", the majority of the respondents (72%) referred to procedural recommendations.

All of the above suggests the need for an in-depth analysis of those procedural recommendations for which there are publication plans.

An analysis of the publication plan for procedural recommendations by the Kazakh SSR Ministry of Health showed that the number of such recommendations has significantly increased recently, which is connected with an increase in the activity of scientists. Thus, during the 10th Five-Year Plan 107 procedural recommendations were published in the republic, whereas during the 11th Five-Year Plan an average of 100 recommendations were published annually.

In order to increase the quality of the published recommendations, in 1983 50% of the presented works were directed to leading institutes for review.

In 1982-1983, 197 recommendations were approved. Ninety works had reviewers' notes before publication and the authors were required to make corrections before the recommendations were approved by the Kazakh SSR Ministry of Health.

One extremely important index is the quality of the recommendations. Of those responding to this question, 30% noted the high quality of procedural recommendations published at the union level, 18% also highly valued the procedural recommendations published in the republic.

Works are often presented which have frequent references to the literature, exceed the size of the publication and have other shortcomings.

Procedural recommendations presented for inclusion in the publication plan are carefully studied by the Scientific Medical Council of the Kazakh SSR Ministry of Health and are reviewed by the leading specialists of our ministry, by Scientific Councils, Problem-Solving Commissions and the leading institutes of the USSR Academy of Medical Sciences. In so doing, the Scientific Medical Council of the Kazakh SSR Ministry of Health often has to recommend that several works be published as articles, since the style and material content do not meet the requirements. It sometimes happens that there are procedures in the recommendations that have already been incorporated into public health. Thus, in the 1984 requests of the Karaganda

Medical Institute, the Kazakh Scientific Research Institute for Epidemiology, Microbiology and Infectious Diseases, the Alma-Ata Institute for the Advanced Training of Physicians and the Semipalatinsk Medical Institute, procedural recommendations were encountered which contained already familiar tenets and lacked any innovation. Naturally, such proposals were refused.

Procedural recommendations continue to be presented without taking into consideration the real possibilities for incorporating the offered research efforts into the practice of public health. The following are particular examples: "Treatment of Malignant Neoplasms Using Fast Electrons" (the Kazakh Scientific Research Institute of Oncology and Radiology), "Atomic-absorption Spectrophotometry of Lead in the Environment and Biological Material" (the Scientific Research Institute of Marginal Pathology), and "Photochemotherapy of Several Dermatoses Under Conditions in Kazakhstan" (the Scientific Research Institute of Skin and Venereal Diseases).

Thus, the information obtained with the aid of the survey of physicians practicing public health demonstrated that procedural recommendations are one of the popular forms of incorporation and, in this connection, the Scientific Medical Council of the Kazakh SSR Ministry of Health is carrying out specific work to increase demands for higher quality in published procedural recommendations.

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CSO: 1840/1901



## HEALTH STATE OF INFANTS BASED ON FEEDING, BIOLOGICAL, SOCIO-HYGIENIC FACTORS

Kishinev ZDRAVOOKHRANENIYA in Russian No 1, Jan-Feb 85  
(manuscript received 30 Nov 84) pp 37-39

[Article by V. P. Chenusha and L. F. Chokyrla, Pediatric Problems Laboratory, Kishinev Medical Institute: "On the Health State of Children in Their First Year of Life Depending on Aspects of Their Feeding and Certain Biological and Social-Hygienic Factors"]

[Text] One of the leading factors ensuring the harmonic development of a child and his resistance to unfavorable environmental effects and full immunological production of the organism is prudent nutrition (M. Ya. Studenikin, K. S. Ladodo, 1978; K. S. Ladodo et al., 1982 and others). The importance of breast feeding is hard to overestimate. Under any conditions, mother's milk is the best food for infants, especially in the first months of life (WHO CHRONICLE, 1979). The tendency toward reduction in the frequency and duration of breast feeding which has recently been observed presents some cause for alarm. We know that disruption in the nutrition of children leads to a weakening of the reactivity of the child's organism and to the emergence of various pathology (G. I. Zaytseva et al., 1975; S. G. Lazarev et al., 1976; Ye. M. Fateyeva, 1980 and others).

The task of this work was to study the health state of children in their first year of life (160 boys and 166 girls) based on their rate of illness according to data from polyclinic visits and hospital treatments. The birth history (form 096/u), the newborn development history (form 097/u), the child development history (form 112/u), the medical outpatient file (form 025/u) and the hospital patient file (form 003/u) were all subject to analysis.

Among those studied, 236 (72.4 percent) of the children had had various illnesses in the first year of life. Of these, 140 (59.3 percent) had infrequent illnesses (less than 3 times per year), and 96 (40.7 percent) had a high frequency of illness (more than 4 times per year). There were more boys than girls in the group with high frequency of illness--44.1 and 36.7 percent, respectively ( $P < 0.01$ ).

The most common illnesses in the first year of life were acute respiratory viral infections (ORVI). This pathology was noted in all 236 children who had been ill. The second most frequent pathology consisted of various birth traumas, which were noted in 79 (33.5 percent) of the children. These were observed 1.5 times more frequently in boys than in girls. A close connection was found between acute respiratory pathology and birth trauma. All the children born

with birth trauma had suffered ORVI. Of these, 53.9 percent had frequent illness, and 46.1 percent--infrequent ( $P < 0.01$ ). Thus, birth trauma must always be viewed not only as a high risk factor in ORVI illness, but also as a factor facilitating the transition of this pathology into a prolonged and recurrent course.

Intestinal pathology was observed in 26 (11 percent) of those who had been ill. The sex of the child had no effect on intestinal infection illness.

The study of the health state of children in their first year of life based on aspects of their feeding presents a constant and practical interest. It has been determined that of the total number of children studied, 46 percent received natural feeding (nursing). Of the 175 children receiving artificial feeding, 73 percent received adapted formulas ("Malysh", "Vitalakt"), and 27 percent of the children received non-adapted formulas ("Biolakt," kefir). We must note that the children who received natural feeding had a lower rate of illness. Thus, of the 151 children receiving mother's milk, 65 (43 percent) had been ill, and 59 (90.7 percent) of these had an infrequent rate of illness (1-2 times per year). The frequency of illness in the other 6 children, who were ill frequently (3-4 times per year) was predetermined by the presence of birth trauma. We must also note that intestinal pathology arising as a result of gross disruptions in feeding was noted in only two of the children.

An entirely different picture was observed among the children who received artificial feeding. In this group the rate of ORVI illness was 2.5 times more frequent, and the relative share of those with high rate of illness was 4.5 times greater. Consequently, artificial feeding, even if it is administered according to all the rules, must be viewed as a high risk factor in child illness during the first year of life. The latter circumstance is especially facilitated by the early (in the first month of the child's life) transition to artificial feeding. Thus, of the 86 children with high rate of illness who received artificial feeding, 55 (63.9 percent) of them had been changed over to this type of feeding in the first month of life. With changeover of the children to artificial feeding in later periods, the relative share of those with high rate of illness was reduced.

Intestinal pathology among children receiving artificial feeding was observed 5 times more often than in children receiving mother's breast milk (14 and 3.1 percent, respectively;  $P < 0.01$ ). The development of this pathology may have been facilitated by deficiencies in nutrition as well as the constant stress of fermentative activity of the intestinal tract which usually occurs in these cases. According to the literary data, already 2-3 days after the start of artificial feeding, these children exhibit the same microbes in their intestinal tract as are present in the adult (S. Neychev, 1977).

The reasons for transferring children to artificial feeding have been quite broadly illuminated in the literature. However, only in recent years have there been reports pointing out the dependence of transferring children over to artificial feeding on the nursing periods (B. I. Aronova et al., 1982; West, 1980 and others). The analysis performed in this direction has shown that of the overall number of children whom we studied, only 44 (13.5 percent) were nursed by the mother in the first 6 hours after birth. These were healthy

children born from the mothers without any pathology. Not one of these children was subsequently changed over to artificial feeding, and none of them had any illness in the first year of life. 162 (49.7 percent) of the children were nursed by the mother in the first 12-24 hours after birth. These were healthy children. However, a certain pathology had been noted in some of the mothers during pregnancy: toxicosis (9.3 percent), hypochromic anemia (23 percent), ORVI (31 percent). It turned out also that 52 (32 percent) of the children from this group were subsequently changed over to artificial feeding, while 122 (75.3 percent) of the children had suffered ORVI or other pathology. The most unfavorable in terms of health indicators was the group comprised of 120 (36.8 percent) children who had been nursed by the mother later than 48 hours after birth. These were children who had been born with large weight (over 5 kg), various birth traumas (79), Rh-factor and ABO system incompatibility (16), or premature infants (25). Along with this, pathology of the mothers was also noted: anemia (18 percent), toxicosis during pregnancy (8.3 percent), rheumatism (4.2 percent), and pyelonephritis (2.5 percent). All the children in this group were subsequently changed over to artificial feeding and had repeated illnesses during the first year of life.

Thus, nursing the infant by the mother within the first 6 hours after birth should be viewed as a great reserve in preventing the changeover of the infants to artificial feeding, as an illness prevention factor, and as a factor in improving the health indicators in the first year of life. This has a favorable effect on the development of lactation in the mother, activates the processes of assimilation and metabolic adaptation in the newborns, and facilitates full development of the immuno-protective forces of the child's organism.

In connection with the favorable effect of natural feeding on the health state of children, we considered it expedient to study its dependence on certain socio-hygienic and biological factors of the mothers. It was found that the types of feeding children in the first year of life did not depend on the level (secondary or higher) education of the mothers. We were able to discern differences in types of feeding in different age groups of the mothers: in mothers aged up to 20 years the children received artificial feeding two times more often than breast feeding. Generally these were women who were studying at vocational-technical institutions or VUZes (48 out of 57 mothers). The fact that all the mothers up to 20 years of age had not used maternity leaves also played an important role in this.

For mothers ranging in age from 20 to 30 years the distribution of children receiving natural and artificial feeding was approximately equal. For mothers over 30 years of age, the children received natural feeding 2.5 times more frequently than artificial. In these cases the mothers made full use of their maternity leaves. Of these mothers, 42 had given birth previously, which indicated their desire for children and their more expressed lactation capacity which is observed in mothers who had given birth previously.

Thus, for young mothers who have not had enough life experience and skill in nursing a child, children become ill much more frequently. The health of children in their first year of life is in direct dependence on their condition at birth, on the type of feeding, and the general level of culture of the mother.

Thorough prophylaxis of pathology of pregnancy and childbirth, full and rational application of maternity leaves, and early nursing of the child by the mother within the first 6 hours after birth, as well as widespread and constant propaganda of the advantages of natural (breast) feeding among the mothers provide great reserves for the prevention of illness and the improvement of health indicators of children in the first year of life.

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12322  
CSO: 1840/1899



## INTERNATIONAL HEALTH EXHIBIT IN MOSCOW

Moscow TASS in English 1718 GMT 28 May 85

[Text] An international exhibition of medical equipment, instruments, tools and pharmaceuticals, "Zdravookhraneniye-85" (Public Health-85), has opened here [today, 29 May 1985]. It is keynoted by the motto "Sound Health and Peace for the Present and Coming Generations". The exhibitors include more than a thousand firms, organizations and enterprises from 24 countries, including Austria, Belgium, Bulgaria, Britain, Hungary, the German Democratic Republic, Denmark, India, Spain, Italy, the Netherlands, Norway, Pakistan, Poland, the Soviet Union, the United States, Finland, France, West Germany, Czechoslovakia, Switzerland, Sweden, Yugoslavia and Japan, as well as West Berlin.

The number of its participants and the area allotted for their stands makes "Zdravookhraneniye-85" the biggest international exhibition organized this year by the "expocenter" association of the Chamber of Commerce and Industry of the USSR.

The Soviet section is the largest at the show. It has been organized jointly by 44 ministries and departments and more than 500 factories, organizations, research and development institutes and design bureaus. The more than 4,000 exhibits on display reflect the advances made by medical services and the medical industry in the USSR.

A scientific and technical symposium will be held in the framework of the exhibition, whose program includes reports by Soviet and foreign scientists and experts.

The USSR Ministry of Foreign Trade opened a commercial center at the exhibition.

"Zdravookhraneniye-85" will stay open until June 6.

CSO: 1840/1911-E



PROCEEDINGS OF PERMANENT COMMISSIONS OF TURKMEN SSR SUPREME SOVIET

Ashkhabad TURKMENSKAYA ISKRA in Russian 17 Apr 85 p 2

[Text] TURKMENINFORM--At its meeting held on 15 April, the commission for public health and social security of the Turkmen SSR Supreme Soviet reviewed the issue of improving medical services for the population in the medical institutions of Ashkhabad.

It was noted that, as a result of the work being carried out in the city's polyclinics, the expansion of therapeutic and pediatric sections has been completed, which has allowed the number of patients enjoying these services to approach the norm. The protection of children's health has improved. General infectious illnesses have decreased. In 1984, both an urban psychoneurological and a narcological dispensary were opened. The construction of a polyclinic capable of handling 850 visits per shift continues in the microrayon of Gaudan.

Nevertheless, there are significant shortcomings in the work of the preventive medical treatment institutions of the republic's capital for servicing the population.

In several polyclinics, patients are not seen by specialists. There is no efficient cooperation among the polyclinics concerning questions of patient examination and especially concerning X-ray examinations.

Shortcomings among intermediate level medical employees are becoming evident. The executive committees of the Ashkhabad city and rayon Councils of People's Deputies are not paying enough attention to questions concerning the activities and construction of new medical institutions in the city or to ensuring the efficient work of communal services.

The commission for public health and social security of the Turkmen SSR Supreme Soviet recommended that the Ministry of Health, the executive committees of the Ashkhabad oblast, city and rayon Councils of People's Deputies draw up and implement measures for improving medical services for the population.

12793

CSO: 1840/310

## NEW HOSPITALS IN ESTONIA

Tallinn SOVETSKAYA ESTONIYA in Russian 5 Feb 85 p 1

[Text] Residents of Tallinn have already become accustomed to a cream-colored automobile with a wide red band on its side and the sign "Mobile Resuscitation Unit" rushing through the city's streets. And it is no secret that this car, which appeared in our city several years ago is, although small, the mobile unit of the general resuscitation department of the Tallinn Emergency [Skoraya Pomoshch] Hospital.

The hospital itself, whose construction was fully completed in 1980, has become one of the largest medical centers in the republic's capital. It is designed to hold 800 beds.

Our correspondent I. Gati asked the Deputy Minister of the Estonian SSR Ministry of Health, Yuriy Vladimirovich Markov, the following question: "How is the medical network of the republic being expanded?"

"I will be happy to answer this question. Especially now, on the eve of the elections of our national authority.

"New hospitals are being built every year in the republic's rayons. Let's take 1981. This date marks the completion of the construction of one of the largest rayon hospitals in the Pribaltika, the Central Hospital of Vyruskiy Rayon, designed to hold 400 beds. There is much that can be said about this hospital complex, where the surgery unit alone consists of six operating rooms, where physicians of all specialities work and where the most modern medical equipment is installed. I will confine myself to saying only that the opening of this hospital has raised the level of medical services for the people of the whole of southern Estonia.

"The work of the planners and builders of this hospital was honored with a USSR Council of Ministers prize.

"In 1982, Iygevaskaya Central Hospital with 205 beds was built. Two years earlier, the rayon hospital in Pylva was built. And in 1983, a new wing was added to the hospital in Kilingi-Hymme. I will note that it was built at the request of the electorate.

"Wouldn't you agree that the rayon hospitals clearly have something distinctive about them. This is no accident. Last year, for example, Vil'yandiskaya rayon hospital was built according to the design of Vyruskiy hospital.

"Well, since 1980, we have opened hospitals totalling 2067 beds and outpatient clinics designed to handle 3616 visits per shift.

"Work is continuing apace for this year. Proposals have been made to build a central pediatric polyclinic in Tallinn, an eye clinic and polyclinic in Lasnamyae, and rayon hospitals in Kingisepp and Rakver.

"The republic is building, rejuvenating and beautifying. And in the construction of new buildings an important place has been set aside for institutions that keep watch over our health."

Pictured above: general view of the central department of Vyruskiy hospital; a mobile resuscitation unit speeds along with its emergency signal turned on. Photos by P. Vendelin and V. Pud'ko (Estonian News Agency).

12793

CSO: 1840/310

## PSYCHOLOGY

### PSYCHOLOGICAL SERVICES

Moscow OBSHCHESTVENNYE NAUKI in Russian No 1, Jan-Feb 85 pp 199-201

ROMANOVA, Ye., candidate of psychological sciences, scientific secretary, Association of Psychologists of the USSR

[Abstract] The first conference of Soviet psychologists engaged in the administration of psychological services was held in Moscow in May 1984. The conference was organized by the Association of Psychologists of the USSR and the Institute of Psychology of the USSR Academy of Sciences. The plenary session was opened with presentations by Yu. Zabrodin on "Problems of Psychological Services in the USSR", M. Kabanov on "Fundamentals of Medical Psychological Services", I. Dubrovina on "Theoretical and Methodological Questions of Education Psychological Services", and with a presentation by M. Gamezo on "Psychological Services at Higher Educational Institutions". Similarities and differences in the administration of such services in the different setting were discussed and analyzed, with the underlying theme being the development of a socialist personality with a communist approach to study, work, family and society. The conference ended with recommendations to publish a series of brochures dealing with administrative and organizational matters to facilitate the work of psychological service personnel, to provide for the psychological education of engineering and other technical cadres, and to improve the quality of practical training that psychologists have received. [322-12172]

SENSITIVITY ANALYSIS OF MODEL OF TERRESTRIAL FOOD CHAINS

Moscow ATOMNAYA ENERGIYA in Russian Vol 58, No 4, Apr 85  
(manuscript received 30 Jul 84) pp 265-268

GANUSHIK, V., MITRO, A., SABOVA, T. and MUSATOVA, O., Institute of  
Radioecology and Nuclear Technology Utilization, Czechoslovakia

[Abstract] Sensitivity coefficients were analyzed for a model of a terrestrial food chain system, in which a distinction was made between direct radionuclide contamination of plants by precipitation, and indirect contamination resulting from radionuclide uptake from the soil. The study was conducted in terms of 22 radionuclides, excluding  $^3\text{H}$  and  $^{14}\text{C}$ , encompassing wheat, fruits, cabbage, potatoes, milk, meat and cucumbers. Determinations of the sensitivity coefficients for such factors as soil to plant, feed to milk and feed to meat transport, time for plant maturation, harvest time to food production, etc., led to formulation of relationships depicting the relative contribution of each factor to the radioactive load. Such data can be useful in a stochastic approach to the monitoring of radionuclide migration along a terrestrial food chain, and the planning of radioecologic studies. Uncertainties come from inadequate information on variability in various factors and nonlinearity among the various factors. References 3: 2 Russian, 1 Western. [306-12172]



BRUCELLA VACCINES FOR CATTLE

Moscow VETERINARIYA in Russian No 12, Dec 84 pp 26-28

SHUMILOV\*, K. V., AL'BERTYAN, M. P., KLOCHKOV, A. A. and ROMAKHOV, V. A.,  
\*All-Union Scientific Control Institute of Veterinary Preparations; All-Union  
Institute of Experimental Veterinary Sciences

[Abstract] The general problems of vaccination of cattle against brucellosis are reviewed, along with indications of the most extensively used vaccines. In general, *Brucella abortus* strain 19 vaccines have found the widest application on a global scale, although trials with other strains have also undergone clinical testing. Recently, the authors have conducted extensive testing of live *Br. abortus* 104-M vaccines. Dose comparisons with the 104-M vaccine have shown that immunization with 3 billion cells of 5-6 month old calves leads to immunity in 50% of the animals that is of relatively short duration, while a full dose of 80 billion cells renders 83.3% of the animals immune, with immunity persisting for at least 211 days. Although preventive inoculations are an effective means of protecting the animals from brucellosis, they have to be utilized in conjunction with the full measure of other sanitary and control schemes to assure effective protection of cattle herds.  
[318-12172]

SENSITIVITY OF GOAT EMBRYO KIDNEY CELL CULTURE TO NEWCASTLE DISEASE VIRUS

Moscow VETERINARIYA in Russian No 1, Jan 85, pp 77

KORSUN, L. L., EFIMOV, N. I., KOLYUVAMIOKO, E., NKODIA, E. and VEMBE, Zh.,  
Scientific Veterinary Laboratory, Peoples Republic of the Congo, Brazzaville

[Abstract] The purpose of this study was to determine the possibility of reproduction of Newcastle disease virus in a goat embryo kidney cell culture, the sensitivity of the culture to the virus and the degree of accumulation of the virus in the culture. A 2-3 day cell culture in MEM medium with 0.5% lactalbumin hydrolysate and 5% ox serum was used in the tests. The virus-containing suspension was prepared with penicillin, streptomycin and nystatin. A monolayer culture was incubated at 37°C and examined microscopically at 16, 18, 24, 48, 72 and 96 hours. The experiments confirmed the possibility of using the cell line tested for reproduction of Newcastle disease virus. Further studies showed good accumulation of the virus in a culture monolayer. Figure 1.  
[319-6508]

## SURVIVAL OF PASTEURELLA OF STRAIN K AFTER REHYDRATION AND IN AEROSOL STATE

Moscow VETERINARIYA in Russian No 1, Jan 85, p 36

RUBCHENKOV, P. N., All-Union Scientific Research Institute of Veterinary Sanitation

[Abstract] The purpose of this work was to seek a protective medium for the preservation of lyophilically-dried pasteurilla of vaccine strain K after rehydration and in the aerosol state. The experiments utilized commercial dry vaccine against pasteurellosis of water fowl. The protective media tested included buffered saline solution, a 5% solution of dry non-fat milk with 5% neutral chemically pure glycerine, a glycine buffer containing peptone and 5% glycerine. The medium containing the glycine buffer, peptone and 5% glycerine yielded best survival times under all temperature conditions and in the aerosol state.

[319-6508]

## CHANGE IN RIBONUCLEASE ACTIVITY IN MICE INFECTED WITH FOOT AND MOUTH DISEASE VIRUS

Moscow VETERINARIYA in Russian No 1, Jan 85, pp 32-34

KURINENKO, B. M. and ALEKSEYEVA, I. I., Kazan' State University imeni V. I. Lenin

[Abstract] Results are presented from a study of the change in activity of endogenous RNAase with pH 7.2-7.4 in the process of development of the viral infection. White mice were infected with various doses of the foot and mouth disease virus A<sub>22</sub>-550. The mice were sacrificed, blood collected and serum extracted. Organ and muscle samples were also taken. Ribonuclease activity was determined in blood serum and 5% organ and muscle sample homogenates. In mild cases caused by infection with 0.1 LD<sub>50</sub>, a significant rise in RNAase activity was observed in all organs and tissues. In severe cases caused by infection with 10,000 LD<sub>50</sub>, RNAase activity dropped significantly in skeletal muscles and blood serum. In the cardiac muscle and liver, there was a slight rise in activity during the first six hours of the process. After twenty-four hours activity was reliably lower in the cardiac muscle and liver. The data are consistent with participation of ribonuclease in the formation of the antiviral barrier, indicating participation of this enzyme in the pathogenesis of foot and mouth infection. Figures 2.

[319-6508]

STANDARDIZATION OF LABORATORY METHODS OF DIFFERENTIAL DIAGNOSIS OF FOOT AND MOUTH DISEASE

Moscow VETERINARIYA in Russian No 1, Jan 85, pp 31-32

SHAZHKO, Zh. A., MISHCHENKO, V. A., MASLOVA, N. S., SHAZHKO, L. F., POTAPENKO, G. A., SHVETSOV, Yu. F. and SHUT', N. N., All-Union Scientific Research Institute of Foot and Mouth Disease

[Abstract] A study is reported of the stability of experimental specimens of strain-specific sera obtained from live and inactivated viruses, as well as strain-specific antigens obtained by various methods, over forty series in all. Preparations were tested not only for activity but also for strain specificity, specific serologic activity, content and fractional composition of proteins. It was concluded that recent changes in the technology of preparation of diagnostic sera and standard antigens for the foot and mouth disease virus have significantly improved their specificity, activity and stability. Diagnostic materials presently manufactured have high quality.  
[319-6508]

ELIMINATING CHRONIC INFECTIONS

Moscow VETERINARIYA in Russian No 4, Apr 85, pp 10-17

KRYUKOV, S. Ya., chief, Veterinary Department, Omsk Oblast, KHAYKIN, B. Ya., doctor of veterinary sciences, NOVITSKIY, A. A., candidate of veterinary sciences, Siberian Veterinary Scientific Research Institute, PAL'GUY, G. G., chief physician, Sherbakul'skiy Rayon Omsk Oblast, KUZNETSOVA, S. N., chief physician, Engel's State Farm, Sherbakul'skiy Rayon, Omsk Oblast, PADALITSA, A., chief physician, Veterinary Department, DANCHENKO, A., chief physician, Suzunskiy Rayon, Novosibirsk Oblast, KOPYLOV, V. P., chief, Epizootic Detachment, Tyumen' Oblast, OMAROV, L., chief, Khasavyurtovskaya Station for Control of Diseases of Animals, Dagestan Autonomous SSR., TSAPENKO, V. M., chairman, Kolkhoz imeni Blagoyev Ivanovskiy Rayon, Odessa Oblast

[Abstract] This is a group of articles which discuss briefly the experience of each of the authors in the control of chronic diseases among animals in their areas. The articles list such steps as cleaning up barns, organizing systematic disinfection of animal husbandry work areas, organization of antiepidemic detachments, sacrificing of diseased animals, vaccination against brucellosis, training of personnel, and in one place complete replacement of all animals on a farm, including dogs and horses, and isolation of breeding stock. All plans for these health improvement measures were thoroughly discussed with and ratified by the appropriate authorities. In every case, tuberculosis and brucellosis chronic infection was completely eliminated.  
[317-6508]

USE OF VACCINES FROM STRAINS BR. ABORTUS 19 AND BR. MELITENSIS REV-1 TO PREVENT BRUCELLOSIS AMONG SHEEP

Moscow VETERINARIYA in Russian No 4, Apr 85 p 32

BAZALEY, F. K., YEVSTAFIADI, K. P., TARAN, I. F. and TSYBIN, B. P.

[Abstract] Sheep inoculated with vaccine of the strain Br. melitensis Rev-1 receive stronger immunity than animals inoculated with vaccine from the strain Br. abortus 19. In the sheep farms of Stavropol' Kray, since 1976, vaccination with Br. melitensis Rev-1 has been used to immunize animals in farms where contact with the disease is possible. In 1980, at one farm, brucellosis-induced abortions occurred among sheep previously inoculated with vaccine from the strain Br. melitensis Rev-1. After positively-reacting sheep from the flock were eliminated, a vaccine from the strain Br. abortus 19 was used on the ewes, Br. melitensis Rev-1 on yearlings. This resulted in elimination of the disease by 1983.

[317-6508]

UDC 619:616.5:599.5/.53

DISEASES OF SKIN OF CETACEANS (REVIEW OF LITERATURE)

Moscow VETERINARIYA in Russian No 4, Apr 85, pp 36-39

ZAKHAROVA, T. I. and DRALKIN, A. V.

[Abstract] Skin diseases among dolphins and other cetaceans in captivity are among the primary causes of death. Skin pathologies can include trauma, infectious and noninfectious disease and parasites. Skin trauma may be caused by being caught, beaching, transportation, captivity in a limited space, attacks of other cetaceans or predators, as well as exposure to the sun, chemicals or water of reduced salinity. Infectious diseases, including viral, bacterial and fungal, parasitic diseases, infection with diatomaceous algae and various parasitic diseases and tumorous diseases are briefly discussed, the discussions representing a classification rather than exposition of etiology and prognosis. Although this is a review of the literature, bibliographic references are incomplete, consisting only of author's name and year of publication, omitting the source.

[317-6508]



## VETERINARY SANITARY MEASURES FOR ANTHRAX

Moscow VETERINARIYA in Russian No 2, Feb 85, pp 20-22

IPATENKO, N. G., ANTONYUK, V. P., All-Union State Scientific Testing Institute of Veterinary Preparations; and GUSHCHIN, V. N., Main Administration of Veterinary Medicine, USSR Ministry of Agriculture

[Abstract] Several methods have been recommended for decontaminating the soil in anthrax foci. In this study, 20 soil specimens were taken at depths of up to 10 cm from areas where cases of anthrax had been reported. The soil was disinfected with a hot 10% solution of caustic soda, then a 25% solution of calcium hypochlorite containing at least 5% active chlorine. The pathogen was still found in the soil. The entire territory was then irrigated with a hot 10% solution of caustic soda at 10 liters per square meter, plowed to a depth of 25 cm, carefully mixed with dry calcium hypochlorite containing 25-28% active chlorine and abundantly irrigated. The pathogen was then no longer found in the soil. Noninfected animals were treated with an 8% solution of iodine monochloride, clarified with a solution of calcium hypochlorite containing 4% active chlorine, followed by hydrogen peroxide 3% with acetic acid 0.5%, calcium hypochlorite or sodium parachlorobenzene sulfochloramide containing 4% active chlorine, 2% potassium tetrachloriodide and an aqueous solution of trichloroisocyanuric acid containing at least 0.7% active chlorine. 25 to 28% Solutions of hypochlorite containing 5% active chlorine and a 4% solution of formaldehyde were used to disinfect contaminated rooms. [320-6508]

UDC 619:616.988.23:616.831.8:616.9-084.47

## SPECIFIC PROPHYLAXIS OF AUJESZKY'S DISEASE IN PIGLETS

Moscow VETERINARIYA in Russian No 2, Feb 85, pp 35-38

VINOGRADOVA, V. I., IONOVA, O. P., SHOSHOKIN, V. A., YUSUPOB, R. Kh. and KUZNETSOV, V. V., Kazan' Veterinary Institute

[Abstract] Results are presented from a study of the ability of newborn piglets to form an immune response to Aujeszky's disease antigen and a determination of the stage of development of immunocompetent cells in fetuses. Studies were performed on seventy piglets and six fetuses from swine, some of which had been vaccinated against Aujeszky's disease. Specific virus-neutralizing antibodies in forty-five piglets with colostral immunity were found in titers of 1:2-1:4 over 21 days. The content of immunoglobulin in blood serum of these piglets was high during the first two days. The number of macrophages and plasmacytes in the spleen and lymph nodes was relatively low. Intracerebral infection of piglets with colostral immunity showed that they had no resistance to this infection. Specific virus-neutralizing antibodies were found in the serum of piglets vaccinated at 1-day age from nonimmunized mothers by the seventh day. Intracerebral infection of these piglets 21 days



after vaccination did not cause the disease. Changes characteristic for active immunological processes were observed in these piglets. The capacity of forming specific immunity by immunization of piglets at an early age results from the presence and active status of all immunocompetent cells in the lymph organs of the fetuses, observed in the last third of gestation. [320-6508]

UDC 619:612.014.48:636.51

#### CONTENT OF SERUM LYSOZYME IN CHICKENS IN ONTOGENESIS AND WITH EXPOSURE TO RADIATION

Moscow VETERINARIYA in Russian No 2, Feb 85, pp 60-62

POTAPOVA, T. V., SHPOLYANSKIY, Yu. V. and NISHANBAYEV, K. N., Institute of Biochemistry, Uzbek Academy of Sciences

[Abstract] A study was made of the dynamics of changes in the concentration of serum lysozyme in developing intact and irradiated embryos and chickens (white leghorns). Eggs were irradiated two hours before incubation by  $\text{Co}^{60}$  gamma rays at 0.297 Gr. Serum lysozyme content was determined spectrophotometrically each day beginning in the ninth day of development and continuing through hatching, then in chicks from the first day of life through age 120 days at intervals of 2, 5, 10 and 30 days. A low lysozyme content (0.01-2.00  $\mu\text{g/ml}$ ) was found in the blood serum of nine-day irradiated and nonirradiated embryos. Subsequently, as the embryos developed, significant fluctuations were observed in lysozyme content, transferring from egg to embryo. Small doses of radiation were found to influence the dynamics of lysozyme content. Metabolic processes and rates of differentiation of cell populations producing lysozyme in high concentrations are stimulated by small radiation doses. References 15 (Russian). [320-6508]

#### NEUTRALIZATION REACTION IN A CULTURE OF TRANSPLANTABLE GOAT EMBRYO KIDNEY CELLS WITH NEWCASTLE DISEASE VIRUS

Moscow VETERINARIYA in Russian No 2, Feb 85 pp 76-78

KORSUN, L. L., NKODIA, E. and KOLYUVAMIOKO, E., Scientific Veterinary Laboratory, Peoples Republic of the Congo, Brazzaville

[Abstract] A transplantable culture of goat embryo kidney cells sensitive to Newcastle disease virus was employed in the neutralization reaction. A standard antigen was used to determine the titer of virus-neutralizing particles. The cells in the transplantable culture were found to be no less sensitive in the neutralization reaction than chick embryo cells, the neutralization index sometimes being higher. No significant difference was found in the titer of virus-neutralizing antibodies in the blood serum of

vaccinated chickens and in the cell culture. The cell culture has certain advantages: a monolayer of cell culture was produced by the third or fourth days, from chick embryo cells only on the 10th or 11th days.  
[320-6508]

UDC 619:576.807.7:576.856.7

#### ANTIGENIC RELATIONSHIP, DIFFERENCES AND DOMINANCE OF ANIMAL VIRUSES

Moscow VETERINARIYA in Russian No 3, Mar 85 pp 28-31

SOBKO, A. I. and PRISKOKA, V. A., Ukrainian Scientific Research Veterinary Institute

[Abstract] Complete description of animal viruses being studied calls for consideration of their antigenic affinity, differences and dominance as these factors relate to one another by cross testing of 2 or more viruses and serums strain-specific to them in order to provide objective data concerning conformities or differences of antigenic determinants. The use of reactions of neutralization, complement fixation and diffusion precipitation in studies of these factors is described and discussed briefly. A method for determining antigenic relationships for polymyelitis pathogen may also be used to study animal viruses. The methods discussed permit determination of likenesses and differences of animal viruses at less cost and with more rapid diagnosis than is possible by use of other procedures. Assessment of a virus strain by these indicators prevents errors in selection of a vaccine strain. In regard to the interrelationship of these indicators, during an antigenic affinity of more than 70 percent and differences of less than 30 percent, the dominant strain will have the advantage. Figure 1; references 16: 6 Russian, 10 Western.  
[316-2791]

UDC 519:615.371:616.982.17

#### DRY LIVE VACCINE AGAINST SWINE ERTSIPELAS

Moscow VETERINARIYA in Russian No 3, Mar 85 pp 31-33

PODLESNIYKH, L. A., D'YAKONOV, O. B., DUSEUK, R. V., NIKIFOROVA, N. M., ZOBETS, N. A., DOTSENKO, V. V. and BONDARENKO, V. Ye., All-Union State Control Scientific Research Institute of Veterinary Preparations

[Abstract] This article presents results of studies of development of a method of preparing and controlling a standard dry vaccine against swine erysipelas from strain VR-2, which has high immunogenic properties, does not cause post-vaccination reactions, is resistant to unfavorable external effects, can be stored for at least a year and is suitable for both group and individual immunization. Two-fold immunization of swine with this vaccine in a  $2 \cdot 10^8$  live microbial bodies dose, intramuscularly, protects against infection for the period of observation (6 months).  
[316-2791]

## EFFECT OF DIBAZOL ON IMMUNOBIOLOGICAL INDICATORS IN BROILER CHICKS

Moscow VETERINARIYA in Russian No 3, Mar 85 p 33

KHLOPINA, A. F., All-Union Scientific Research Veterinary Institute

[Abstract] A study of the effect of dibazol on some indicators of non-specific resistance of chicks and on their resistance to experimental bacillary white diarrhea-typhoid fever infection is described and discussed. Day-old broiler-chicks were placed in an aerosol cloud of dibazol ( $50 \text{ mg/m}^3$ ) for up to 50 minutes. After 1, 2, 3, 7, 14 and 21 days non-specific resistance of the chicks was determined by blood tests. Effect of dibazol on natural resistance indicators studied appeared 1 day after its inhalation and this was followed by an increase of blood serum enzyme activity. By the 14th day, the increased non-specific resistance indicators levelled off. After experimental bacillary white diarrhea-typhus infection, weight of infected fowl was lower than that of uninfected chicks by  $14 \pm 0.5 \text{ g}$ . This difference was  $12.0 \pm 0.8 \text{ g}$  in chicks treated with dibazol. By the 21st day, the weight of dibazol-treated fowl was  $169.2 \pm 4.5 \text{ g}$  while that of infected but untreated chicks was  $146.0 \pm 7.3 \text{ g}$ . Use of dibazol resulted in elimination of the bacillary white diarrhea-typhus pathogen from the liver one week earlier than was the case for chicks not receiving dibazol.

[316-2791]

## CONFERENCES

### BRIEFS

CATALYSIS CONFERENCE--The first All-Union "Catalysis and Catalytic Processes in Chemical-Pharmaceuticals Production" conference opened in Tashkent on 17 April. Its participants, scientists from academy and branch scientific research institutes and specialists from production associations in Moscow, Leningrad, Kiev, Minsk, Alma-Ata and elsewhere, are discussing problems of the use of various chemical compounds in the manufacture of medicines, using them to accelerate technological operations and improve product quality. They are exchanging experience and planning ways to accelerate the practical introduction of scientific developments. [Text] [Tashkent PRAVDA VOSTOKA in Russian 19 Apr 85 p 3] 11052

AMS GENERAL MEETING--A session of the general meeting of the USSR Academy of Medical Sciences completed its work on 6 April in Moscow. It summed up the results of academy presidium activity for 1980-1984. Elections to the USSR AMS presidium were held at the session. Academician N. N. Blokhin was re-elected president of the USSR AMS, S. S. Debov and L. A. Ilin were elected vice-presidents and Yu. I. Borodin was elected chairman of the presidium of the Siberian Division of the USSR AMS. D. S. Sarkisov was elected chief scientific secretary of the USSR AMS presidium. In the resolution adopted, session participants defined the tasks of further developing fundamental research on medical and public health problems in light of the 26th CPSU Congress resolutions and those of subsequent plenums. [Text] [Moscow PRAVDA in Russian 7 Apr 85 p 3] 11052

CSO: 1840/322

## SOVIET-FRENCH SYMPOSIUM ON BRUCELLOSIS

Moscow VETERINARIYA in Russian No 1, Jan 85, p 78

FROLOV, A. M. and GOLUBEV, A. M.

[Abstract] A symposium was held in Moscow [dates not mentioned], and involved members of a delegation of French specialists including L. Perpère of the French Agriculture Ministry, H. Gilbert and L. Balette of the Ron-Merier Company. Eight reports were presented by the French Scientists, five by Soviet specialists. Titles included "Organization of Brucellosis Control in Cattle, Sheep and Goats in France," "Antibrucellosis vaccines produced by the Ron-Merier Company" and "Plan for Production of Vaccines and Reagents To Control Brucellosis." Other topics covered included methods of diagnosis of brucellosis, brucellosis prevention and means of organization of brucellosis control.

[319-6508]

## CURRENT PROBLEMS OF BIOORGANIC CHEMISTRY AND CHEMISTRY OF NATURAL COMPOUNDS

Alma-Ata VESTNIK AKADEMII NAUK KAZAKHSKOY SSR in Russian No 3, Mar 85 pp 74-75

SHARIPOVA, F. S., candidate of chemical sciences

[Abstract] The jubilee scientific conference "Current Problems of Bioorganic Chemistry and Chemistry of Natural Compounds", dedicated to the memory of M. I. Goryayev, active member of the KazSSR Academy of Sciences, was held in Alma-Ata from 1-4 October 1984. The goal of the conference was the exchange of scientific information among chemists and naturalists studying the chemical composition of plants, establishment of the structure of new compounds and synthesis of physiologically active compounds based on them and development and use of new, modern methods in the study of natural compounds. Conference participants included representatives of many scientific institutions of the KazSSR and the USSR. The conference included 3 sections: the chemistry of terpenoids and synthetic biologically active substances, physico-chemical biology and biochemistry and applied biochemistry. Subjects covered at the conference included summary studies in the area of enzymic engineering aimed at creation of biocatalysts with new, useful technical properties and work on practical application of the ideas of M. I. Goryayev and associates in the area of production of dairy butter, milk, protein-fat concentrate and foods which will contribute greatly to fulfillment of the Food Program.

[1881-2791]



## HARMFUL EFFECTS OF VIBRATION

Moscow MOSCOW FIRST PROGRAM in Russian 21 May 85

[Excerpt] A conference on biomechanics held recently in Moscow devoted much attention to the question of the effects of vibration on the human body. Ivor Valterovich Knets [ph], doctor of technical sciences and head of the biomechanics laboratory of the Latvian Academy of Sciences, who attended the conference, summarized the unfavorable effects of vibration upon the body, in connection with the increasing mechanization of industry and society. The symposium, which was organized by the USSR and attended by experts from all over the world, examined the ways of improving working conditions to cut down the harmful effects of vibration. Biomechanics is an expanding science: in the USSR the largest center is the biomechanics center in the Institute of Engineering Science under Academician Frolov.

CSO: 1840/331-E

## MISCELLANEOUS

### DEVELOPMENTS IN USSR MEDICAL INDUSTRY

Moscow TASS in Russian for Abroad 29 May 85

[Excerpt] Polymers are once again reaffirming their high prestige in medicine. Physicians of various specialities, including traumatology, are promising a great future for them. Of interest here is the treatment of bone fractures with the aid of self-dissolving rods which dissolve entirely about a year after the operation. Soviet scientists have proposed using a polymer material for the rods which contains medicinal substances. The new method is already being used, not only in the USSR, but also, for instance, in Belgium, which has acquired a license for the rods; other countries are also showing interest.

This work has been included in the Soviet section of the Moscow international exhibition Public Health 85, where Soviet firms and organizations were featured today. The Soviet medical industry is represented by more than 4,000 instruments, devices, pieces of apparatus and medicines.

CSO: 1840/329-E

## INDUCTION OF SLEEP

Moscow RADIO MOSCOW WORLD SERVICE in English for Abroad 27 May 85

[Excerpt] An item is presented on a new method of sleep-inducement which has been developed at the Soviet Institute of Labor Hygiene and Occupational Diseases. It is described by Leonid Khryanovich who helped to develop the method. Sleeplessness is cured by means of looking at a screen with colored stripes, which stimulates the body's biological rhythms. The device is called the electronic hypnotist and is now being manufactured. It will be helpful to those who need to sleep at irregular hours because of their occupations and will not damage the general health of people using it.

CSO: 1840/329-E

## MECHANISM OF ACTION OF STATIC ELECTRICAL FIELD IN WATER DISINFECTION

Kiev DOKLADY AKADEMII NAUK UKRAINSKOY SSR: SERIYA B. GEOLOGICHESKIYE, KHIMICHESKIYE I BIOLOGICHESKIYE NAUKI in Russian No 4, Apr 85  
(manuscript received 10 Oct 84) pp 73-76

SAVLUK, O. S., DEYNEGA, Ye. Yu., DRAGAN, A. I. and KUL'SKIY, L. A.,  
academician, Ukrainian SSR Academy of Sciences, Institute of Water Chemistry  
and Colloid Chemistry, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] An evaluation was made of the combined effects of metal ions and a static electric field in water disinfection, using *E. coli* 1257 as the test organism. The bacteria were exposed to a combination of  $\text{Ag}^+$  ( $\text{AgNO}_3$ ) or  $\text{Cu}^{++}$  ( $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ) and a constant 30 V/cm electric field in a 1 cm cell. Baseline studies showed that Ag was much more toxic than Cu, and that the toxicity of both ionic species was potentiated by the application of the electric field. The inflexion point on the Zeta potential and the membrane potential was consonant with the shift in the metal ion concentrations. These changes indicated that lower concentrations of the ions were necessary for lethal effects due to greater accessibility to vital sites in the cell as a result of membrane changes. Figures 3; references 8: 7 Russian, 1 Western.  
[1904-12172]

## NEW APPROACH TO SYNTHESIS OF CARBOHYDRATE-BASED CHIRAL MONOPODANDS UNDER PHASE TRANSFER CATALYSIS CONDITIONS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 281, No 3, Mar 85  
(manuscript received 4 May 84) pp 589-591

ZHDANOV, Yu. A., corresponding member, USSR Academy of Sciences, ALEKSEYEV, Yu. Ye. and SUDAREVA, T. P., Rostov State University imeni M. A. Suslov

[Abstract] Monohydroxylated blocked monosaccharides were reacted with ditosylated oligoethylene glycols under phase transfer conditions to give chiral monopodands--acyclic coronand analogues. Dicyclohexylidene glucose was reacted with oligoethylene glycol ditosylates containing one to four repeating

units, in benzene and aqueous sodium hydroxide containing benzyltriethylammonium chloride. Yield of podand was 95% to 97%. When ethylene glycol or 1,2-dichloroethane were used as reagents, the monoalkylation products 1,2,5,6-di-O-cyclohexylidene-3-O-(beta-tosyloxyethyl)-alpha-D-glucopyranose and 1,2,5,6-di-O-cyclohexylidene-3-O-(betachloroethyl)-alpha-D-glucopyranose formed with yields of 10% and 20% respectively. Selective hydrolysis of the smallest podand in acetic acid gave a bis-diol, which was oxidized to a bis-aldehyde with periodate. The podands and the bis-aldehyde did not complex sodium or potassium. This new synthetic approach is distinguished by the absence of regiomer products and by very high yields. References 5: 3 Russian, 2 Western.  
[1846-12126]

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CSO: 1840



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